THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 37 JUNE, 1935 No. 3

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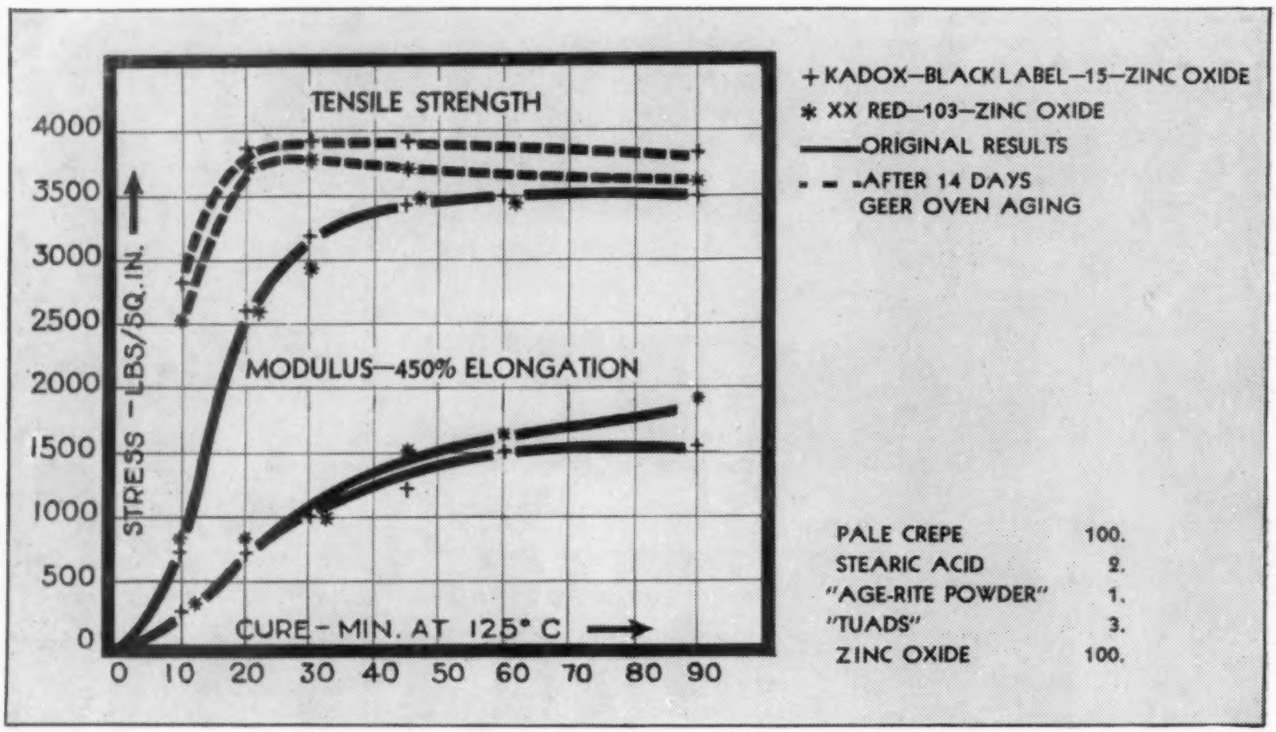
ZINC OXIDE and "TUADS" in a heat and moisture resisting compound

No. 39 of a series of charts showing a comparison of "FAST" and "SLOW" curing zinc oxides with typical accelerators.



The above compound was suggested* for supporting beakers in steam bath evaporations.

Strips of these compounds 0.1 inch in thickness were tested in boiling water for 500 hours and showed the following volume increases expressed in per cent:

Kadox Black Label Zinc Oxide 5.71%

XX Red-103 Zinc Oxide 6.40%

*J. A. Scherrer, National Bureau of Standards
Industrial and Engineering Chemistry
(Analytical Edition) 5, 22 (1933)

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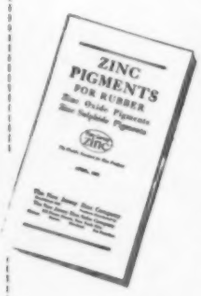

ZINC PIGMENTS FOR RUBBER

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2

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THE RUBBER AGE

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Vol. 37 JUNE, 1935 No. 3

Coal Tar Products In Rubber Compounding

By George Warren Smith

THE use of coal tar and coal tar products in rubber compounding has been practiced from the earliest days of rubber manufacturing. It is interesting to compare the early history of rubber with that of coal tar and to note that each industry was born in approximately the same period. The first use of coal tar in connection with rubber occurred in the early 1800's when it was found that by partially distilling the tar, an unidentified light distillate was obtained which was a good solvent for rubber. However, it was the middle of the nineteenth century before each industry really became established.

The discovery of vulcanization by Charles Goodyear in 1839 gave the rubber industry its necessary impetus, while the isolation in the early years of the century of benzol, naphthalene, phenol, and other individual products from coal tar led to the discovery of a long list of coal tar chemicals.

Benzol Found Early Use

The previously unidentified portion of the coal tar distillate known as a good rubber solvent was now found to contain benzol. From that day to this benzol has had certain advantages as a rubber solvent over all other commercial solvents. Experience has shown that the amount of dry rubber that can be dissolved in benzol, without raising the viscosity to an unworkable degree, is much higher than with other commercial solvents. Other commonly used solvents give cloudy cements, while benzol cements are clear. Most important in a cement is the property that benzol has of evaporating quickly and completely, leaving no troublesome residue.

After the discovery of vulcanization one of the first divisions of the rubber industry to develop was that of making footwear. It was soon found that the addition of crude coal tar to footwear and similar black stocks was advantageous. The crude tar facilitated processing of the rubber and lowered the compound cost. Early experiments proved this crude tar to be one of the best softeners for rubber, especially from the standpoint of aging and resistance to checking.

After developments in the processing of the crude tar a superior refined tar was furnished to the rubber industry. This refined tar was a real improvement over crude tar as a compounding ingredient for rubber, but was still limited in application.

New Demands of Rubber Industry

In the early nineteen hundreds new developments in the rubber industry made it evident that materials were needed to impart to rubber new and definite properties so that it might become useful in constantly broadening fields. New products were demanded to make the finished rubber article hard, resilient, strong, soft, or tacky, or to resist abrasion, sunlight, oxidation and cracking.

With the development of coal tar chemistry, it became known that crude tar contained a relatively large number of aromatic compounds. These substances being present as mixtures were separated from the crude tar by fractional distillation, chilling, and by treatment with acids and alkalies. Some of the products were found to impart desirable characteristics to a wide variety of rubber products. To meet the needs of the rubber industry refined coal tar products have been developed during the past quarter century which greatly assist the rubber chemist in formulating his compound.

Coal tar products for use in rubber must be made to

exacting specifications. Since the manufacturer of each type of rubber goods demands properties that are peculiar to his product, it is necessary that many coal tar products be available, each suited for its specific purpose. To furnish the rubber manufacturer with such specific compounding ingredients it has been necessary to investigate the properties and the methods of use in rubber compounding of a large number of coal tar products. Such investigations, conducted over a period of years, have made it possible to furnish a selection of coal tar rubber compounding ingredients which offer advantages to the compounder of practically every type of rubber goods. These materials are closely controlled by specifications designed to assure uniform and consistent duplication of properties.

Properties of Coal Tar Materials

The coal tar products used in rubber compounding are characterized by one or more of the following effects:

1. Aid in mixing (as wetting out agents).
2. Add flow to the mixed compound (specifically, in calendering, tubing or molding).
3. Retard scorching.
4. Produce tack if desired.
5. Soften without producing tack.
6. Add hardness, stiffness or flexibility to the compound as the case may demand.
7. Improve oil resistance, heat resistance, or abrasion resistance.
8. Improve tear resistance.
9. Improve aging.
10. Improve flexing resistance.

A typical example of a coal tar product designed to produce a definite class of properties is marketed under the trade mark Bardol.* This material is a coal tar oil of high distillation range having good compatibility with rubber and excellent wetting power for pigments. Its dispersing action makes possible a uniformly mixed compound with resultant high resistance to abrasion and tear. Experience has shown that the aging properties imparted by Bardol are good. Such characteristics are particularly essential in the manufacture of tires and mechanical goods, and Bardol has found wide usage in these and similar fields.

Another interesting coal tar product which imparts entirely different properties to a rubber compound is marketed under the trade mark Carbonex.* This material is a solid black material comprising coal tar hydrocarbons of high molecular weight and containing approximately forty-two per cent of "free carbon." It readily disperses in rubber and confers a tough leather-like property to the rubber. With the aid of Carbonex a hard shoe-tap can be manufactured which has excellent tear and flexing resistance and superior wearing qualities.

Experience has shown that compounds containing Carbonex maintain their excellent tear resistance even under conditions of excessive heat. This property makes such compounds valuable for use in making curing bags for automobile tires. Carbonex compounds also have been found to have improved resistance to acids, alkalies and petroleum oils and greases. These resistant properties make Carbonex of value in hard as well as soft rubber compounding.

Needless to say there are many coal tar products used in rubber compounding besides the two mentioned. However, a description of one other will illustrate how a coal tar product can be made to fulfill the needs of a particular industry, in this case the insulated wire industry. The coal tar product in this case is the "M.R." type and is marketed under the trade mark B.R.C.* Nos. 18, 19 and 20. Experience has shown that when incorporated in an insulated wire formula this material gives excellent milling and working characteristics and good flow to the rubber; also the tubed compound solidifies quickly thus reducing the danger of flat side walls. Other desirable properties which have been obtained with B.R.C. No. 19 are: low water absorption, good dielectric strength, and excellent aging.

* Trade-marks of The Barrett Company

Cumar as a Rubber Ingredient

The compounding ingredients mentioned thus far are representative of numerous products obtained from various crude tars; they range in color from a black of excellent covering power to a dark amber with low tinting strength. There exists another important group of coal tar compounding ingredients, which are lighter in color, marketed under the trade mark Cumar.* This material is a resin made by the polymerization of coumaron and indene liquids present in coal tar naphtha.

Cumar is produced in color varying from pale to dark, and in consistency from semi-fluids to resins of high melting point. Cumar is substantially non-acidic and non-saponifiable, it has a low water absorption and resists acids and alkalies. It is an excellent electrical insulator; it has a high dielectric constant. It has the most universal application in rubber compounding of any coal tar product.

Experience has shown that Cumar is an excellent softener, producing a stock with nice working characteristics. The permanent tackiness imparted by it to uncured stocks has been found to be of assistance in calendering and frictioning operations. Many manufacturers have found that compounds containing Cumar are provided protection from scorching due to the fact that it assists in holding the milling temperature down; at the same time the milling time and power consumption are reduced. Cumar absorbs moderate amounts of free sulphur; this tends to give protection against blooming and deterioration from excess sulphur. In addition to the properties mentioned experience has shown that compounds containing Cumar possess improved resistance to oxidation.

The use of Cumar in amounts up to five per cent of the rubber content in high gum stocks, has been advantageous due to its ability to hasten breakdown, aid in plant handling and impart anti-scorch and good aging properties. In making a tap stock, a high melting point Cumar known as EX grade has been widely used.

The pale colored, higher melting Cumars have been advantageous in the compounding of light colored shoe stocks such as sport solings, etc. They are used in large percentages on the rubber to leatherize and stiffen the compound in a manner similar to Carbonex in the manufacture of black taps.

Relationship of Coal Tar and Rubber Industries

The products that have been dealt with in this article are all obtained from coal tar and are the result of extensive research combined with controlled refining. It is interesting to note, however, that in other fractions of the tar not mentioned here many chemicals occur which when processed by the chemical industry eventually appear in the form of rubber accelerators and antioxidants. Thus are the coal tar and the rubber industries still maintaining the close relationship started at their beginnings in the middle of the last century.

The future demands from the rubber compounder will doubtless become increasingly specific and exacting. No source should be better able to assist in meeting these demands than the coal tar industry with its background of past experience and its continual researches for new rubber compounding ingredients.

Machine and Process Development

Ultimate Success in Development Work Depends Upon Personnel Engaged in It Plus Proper Management of Department in Allocating Problems of All Types

By C. E. Maynard

Factory Manager, Fisk Rubber Corporation

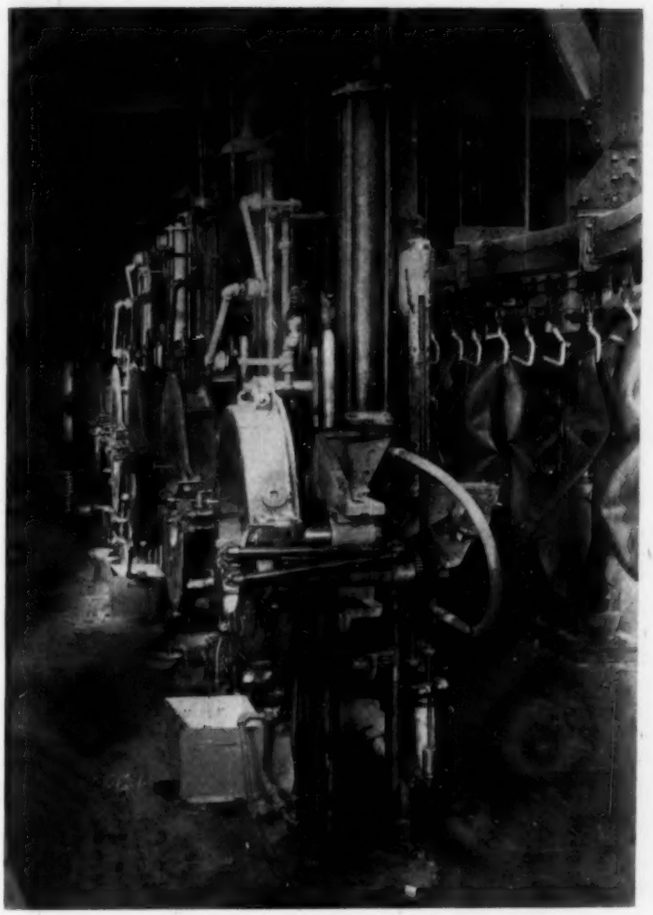
IT IS understandable why a group of chemists should be interested in machine and process development because very often this type of development goes hand in hand with development work carried on by the chemist.

During the last decade tremendous strides have been made in this field. For instance, in our plant (Fisk) about 15 years ago we were making 10,000 tires per day with a force of about 5,500 employees, and about the same number of tubes. Utilizing the same number of hours we can make this number of tires with a force of approximately 1,600 employees. The tires we make today, however, will wear from three to four times longer than the tires made during the previously mentioned period. This illustrates roughly how much progress has been made in our particular industry, and I believe it is typical of what has been taking place in a great many industries in the United States. Those employed in machine and process development, as well as the chemists, have been largely responsible for this progress.

In discussing machine and process development, mention should be made as to the type of individual who should be employed in this work. Of course it goes without saying that ordinarily a man should have technical experience, but above all the individual should have a natural bent towards development work; in other words, he should have inventive ability. Many engineers and technical men may be entirely satisfactory in dealing with the problems of refining and improving to a limited degree the standard methods, but unless they have certain mental attributes they will not be outstanding development men.

To realize the truth of this statement you have only to note that the bulk of the really original ideas in your own plant are generally found to have come from a comparatively few men, even though there are hundreds of men in the organization who are in close contact with the production methods and machinery and consequently are in a position to think in original terms if they have that ability.

A man in development work should have also a knowledge of labor motions. I mean by labor motions ideas and systems such as first propagated by Frank B. Gilbreth. From him and others have come in recent years a method of labor analysis as applied to methods that should fundamentally influence the design of machinery and change in many cases the long standing methods. Labor analysis which has to do with fewer motions in building a product; a co-ordination of both hands; and the better placement of tools, materials and controls for the operation of machinery—all are essential to an engineer in development work today.



Battery of automatic inner tube vulcanizers, developed by Fisk, which cut in half the former labor cost of making inner tubes.

It is entirely possible for two machines to be developed both capable of performing the same operations and yet one have a greater output merely because one engineer was familiar with labor analysis whereas the other was not.

I have seen machines and methods developed to accomplish certain work which were striking in their originality yet ultimately proved to be failures because the regular job already in use was susceptible to great improvement which was finally carried out. A knowledge of labor motions generally makes possible this improvement on our present methods. It shows us what little gadgets and attachments must be added to our present machinery to obtain greater efficiency, and at the same time we learn where the materials, the tools, and the controls should be placed for convenience of operation. It is surprising how much greater output can be obtained from a machine when these so-called minor improvements have been consummated, and many times when this is done a radical idea that one had in mind does not after all prove to be such a great advantage over the old method.

The development man should have scientific knowledge other than mechanics. His developments sometimes deal

This address was delivered before the Boston Rubber Group, A.C.S., on May 17, 1935. Released for publication by American Chemical Society.

with materials which many times vary in their consistency or physical characteristics, and often these variations cause him a great deal of trouble. Sometimes they actually control the direction his development will take. Now, if he is entirely dependent upon the judgment of chemists, for instance, who might not be entirely sympathetic with his development, his progress might at times be very slow or completely checked. If, on the other hand, he has sufficient knowledge of chemistry to judge for himself whether the changes he requires are within the realm of possibility, and if he can possibly suggest to the chemist a method of approach to his problem, he is less likely to be impeded by the material problem involved.

In rubber work particularly many developments have to go hand in hand with developments by the chemists, and if the chemists do not make equal effort towards arriving at the requirements that the development of methods and machinery demand, the ultimate success of some projects become doubtful.

Determination to Get Results

Besides certain technical knowledge, the development man should have a type of dogged determination that is not present in all individuals. This is desirable in all fields of endeavor, but it is especially true of development work. You, as well as myself, have seen developments pass through periods when there appeared to be little chance of success. Obviously there was someone behind these projects with a tremendous determination to have them brought through. Some development men have enthusiasm at the "idea stage" of the development; they retain it even during that period when the major steps are being taken and the idea is being put into machinery; some even carry through to the period when the machine is producing in a limping and hesitant manner in production; but they fail completely when it comes to ironing out the difficulties which confront them and which generally confront every new development for weeks during that period when it is being put into production.

We have had men in our Development Department who were unquestionably good on the first stages of development work but who seemed to lack that final punch necessary to put a job across. There is no question but that it is sometimes a very tedious experience to iron out some of the minor so-called "bugs" in a development project. This inability to finish a job has been so prevalent in some of our development men at times that we have found it necessary to take away from them the development work on the final stages and turn it over to other men in order to obtain the results we were after. This fault in some development men is a serious one and causes a great deal of concern to those who are responsible for obtaining results in the plant.

We had one man in our Development Department who had a meager education, but he did seem to have the natural knack of ironing out little problems that usually occur in putting a new method or machine into production. He had no ability in actually evolving new things or developing a machine from the conception of the ideas, but his ability to stick to and work out the so-called "bugs" many times helped us to put over a job that better trained engineers did not seem to be able to do or to do as well.

I mention this because in the final analysis success in development work in a plant depends to a large degree upon the personnel of the Development Department and how the capabilities of each individual are used to the maximum advantage. If some men are good in conceiving worth while ideas and carrying on development of the ideas to a certain point, they should be used there, and then the work should be picked up by others if they are better adapted for carrying it through to a conclusion.

It occasionally happens that good development men will become stale on the job. For some reason they seem to be unable to hurdle some of the difficulties confronting them. When this happens we have found it good policy to tactfully transfer them to different jobs and turn the problems they have been working upon over to new men with fresh points of view.

First of all a development man should have enthusiasm and a certain strength of conviction that will carry him through when he feels that he is right. This is important. I have seen men drop an idea or a development and actually become what one might call "unsold" upon their own idea because of the opposition of so-called authorities whose judgment they respected. I had this happen once. I had what I thought was a new idea and called in a member of my organization to discuss it. I found that he himself had not only had this idea but had developed it to a point where he had the company take out a patent upon it. Opposition developed and later he discarded the idea as useless. He actually tried to convince me that the idea was impractical and it was only after considerable pressure that I was able to make him get under way with it again. After some work it was put into production and since has saved us a great deal of money.

Imagination, of course, is absolutely essential in a development man. He must be able to think in unorthodox terms. If he has not this ability, there is very little chance of him doing anything big in development. To be sure, his imagination will lead him into ideas which upon first thought seem to be and probably are entirely impractical, but with enthusiasm and persistence many times he can take a seemingly impractical idea and remodel and reshape it so that from it will emerge in new form a really practical scheme. I have seen many an idea that started off as an impractical proposition end up in entirely new form as a workable project.

To illustrate how an idea can be changed around through study and be worked into a practical proposition, I might refer to the Automatic Inner Tube Vulcanizer which we built about seven years ago. We were making our inner tubes previous to this time on straight and circular steel mandrels. We started out with the idea of trying to better our costs in this department by the development of a new method of applying the extruded raw tube stock to the mandrel, removing the cured stock, and splicing together the cured ends of the tube. The more consideration we gave to the problem and to the various methods that might be feasible, the more we became convinced that we should discard completely the mandrel idea of forming the tube and do this work in a mold, thereby eliminating a number of operations and at the same time bring the tube from the mold without any splice visible from the outside.

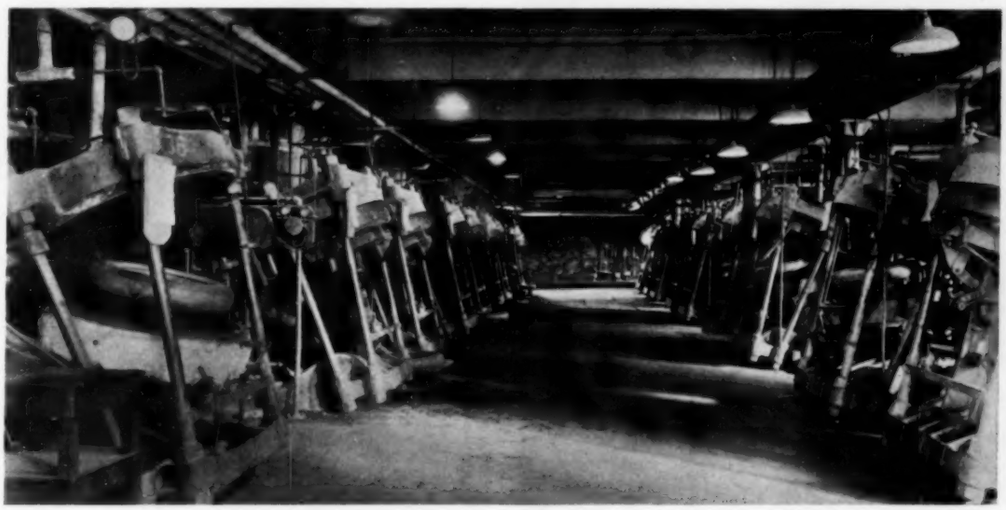
Saving Costs Through Development

About that time the chemists had started to make real progress upon accelerators that would give a comparatively short cure, which of course made the molded tube more practical than in the past. As a result of our investigation, we finally built an Automatic Inner Tube Vulcanizer into which it was necessary only to place the raw inner tube, pull a lever, and later on remove the cured tube. This machine automatically made the connection to the stem, inflated the tube with 75 lbs. air pressure per square inch, cured it for the required time, exhausted the air, and opened the mold leaving the tube free to be easily extracted from the machine. The labor cost of making an inner tube was cut approximately in half.

I might mention that when we saw how practical the Automatic Inner Tube Vulcanizer became we immediately developed an Automatic Tire Vulcanizer which went even further in that we automatically put hot water at a high

pressure on the inside of the tire curing it both inside and out, and at the same time we made the machine remove the tire from the mold upon completion of the cure.

Did you ever notice how the average, radical, new idea in regard to development goes through about three stages? The first stage is where they say, "Can't be done; impractical"; the second, "Nothing new"; and the third, "Why it is nothing at all; I myself thought of that once." Of course, every development man has to face discouragements when he is met with these attitudes, but he does, however, get a certain thrill out of his job that many people never can get from their work. He can see his thoughts materialize into machinery and methods and can readily point to his accomplishments. There is a certain thrill in exercising creative ability. Of course, one does not have to be in mechanical and process development work in order to have this experience.



Other labor-saving devices developed by Fisk engineers are these automatic tire vulcanizers which cure tires both inside and out, and are so constructed that they remove the tires from the molds upon cure completion.

Engineers going into development work usually have one mental characteristic which they must guard themselves against. Through training they have been obliged to organize their mind along what one might call "a set of principles." In learning the manufacture of a product they look over the information available and try, as they have in their scholastic training, to build up the so-called principles. From these principles they start to construct. When they come to judge an idea they are very likely to gauge it by these principles, and if it does not measure up they are prone to discard it. Now this is not always a safe procedure; sometimes these so-called principles are half truths or are entirely erroneous; consequently, engineers in development work sometimes discard feasible schemes.

It has been my experience that the development man who accomplishes the most is the one who attempts to go just a bit further in building up accurate information upon a particular problem, and consequently is able to draw deductions that are different from those of his colleagues. I think it can be said that if you want to make an improvement in any particular field, go just a little further than your predecessors in building up knowledge in that field.

It might be of interest to describe a common procedure which we always use for handling development work from the inception of the idea to its final installation in production. First of all, it is generally good practice to start with cost figures, i.e., a comparison of operating costs—present method versus proposed method. This is desirable because it sometimes shows that the idea is not worth working upon; then again it will show the real monetary advantage to be derived from it if successful. These costs are generally based upon studies made by Time Study or Labor Analysis men who try to visualize and sometimes actually act out the movements required on the proposed machine. Having determined the labor motions and the time periods required, it is then possible to establish the operating cost in so far as labor is concerned.

If the figures prove to be encouraging, then sketches of the proposed device are made up by the Engineering Department, and after one is selected estimated costs on the construction of the equipment are established. With this figure it then can be determined how long it will take the device to pay for itself. If the saving is great enough, or, in other words, if the machine will pay for itself within a reasonable length of time, detail drawings are made and followed by the construction of the machine itself. Either the designer or a field engineer follows the machine into the factory for its preliminary trials, and they are supposed to stay with the machine until it is finally taken over by production.

This routine you might think would be an obvious routine to anyone, but the surprising thing about it is that many machines have been built in this country which never would have been built if a real effort had been made to establish the operating costs of the machine before it was actually built.

Although it may seem a simple matter to mention here, I wish to bring out the necessity of maintaining detailed records of a development as it progresses. Written reports should be made regularly as to the experiments and progress upon the various problems. Sometimes when a development seems to have reached a stalemate the direction that one should take to get out of it can sometimes be seen by reviewing in detail the various experiments that have been made. Of course, the record is invaluable for patent purposes also. In addition, these reports have value in that it makes it possible at any time for one to replace a development man on a certain job without losing the advantage of his experience. And, of course, reports are very helpful to the head of the Development Department because he can very quickly determine what progress is being made and be in a position to offer constructive suggestions towards the solution of the problems.

As in the case of development work along chemical lines, there are really two types of machine and process development; namely, the research type and the routine development work required in improving the product and the machinery that is being used. Kettering of General Motors aptly calls the first "shooting craps with progress." It is the type of development work where your engineers launch out along radically new schemes and ideas not knowing whether they are going to be successful or not, but realizing that if they are the progress in the art will be considerable. This type of development work is very expensive, but the rewards, if you have the right men working upon it, are tremendous, and it is through research development work where most of the great strides in mechanical and process development are made.

To be sure, the second type of development work—that type of improvement where one keeps whittling away at costs through minor improvements to the machinery—is absolutely necessary; but, if you neglect the first, you are likely to wake up some fine day and find that you are far behind your competitors.

Development Work a Necessity

Development work is absolutely necessary in order to protect the stockholders' investment in their plant. Manufacturing concerns who were at one time prosperous and leaders in their field are continually going bankrupt, and if the fact were known you would find that many of them had come to this state because they had failed to keep up their development work and thereby maintain their competitive position. There is to my mind no shorter way of being put out of business than to neglect development and research work. Imagine a tire manufacturing plant today trying to exist if its tire would give the public no more mileage than that which one could obtain from a tire five, ten, or fifteen years ago.

For quite a number of years we have considered our plant a leader in so far as efficiency was concerned; yet if we were to be operating today at the cost we had five years ago, we would be seriously handicapped in meeting competition. So, from the standpoint of good business, every plant should do some development work.

Many people have looked upon this continual improvement in machinery and methods in this country as being actually dangerous to our social well-being. You have undoubtedly heard opinions expressed that there should be a check in the development of labor saving machinery. It is very difficult, as in the case of all economic problems, to definitely determine the total effect of the increased use of labor saving devices and better machinery upon our social structure, but I am one of those who believe that on the whole the effect is good rather than bad and that to attempt to rigidly control it would do more harm than good.

To be sure, with new machines being invented every day and with improvements being made on the old ones, industry is kept in a continual state of flux. Some plants are being pushed out; others are being built up. This is undoubtedly disheartening to those who are unfortunate enough to be located in plants who cannot follow the natural trends; on the other hand, it is stimulating and advantageous to those groups who are successful. By not creating a standardized condition on machinery and methods, we are making it possible for those who have inventive and constructive ability to exercise their talents, and, in my opinion, create new opportunities for many others than themselves.

Statistics do not indicate that the increased introduction of labor saving devices has decreased employment, in spite of the general impression that it has. The National Industrial Council has found that whereas certain machines may have displaced workers, others created work where no work existed before. The census of 1930 reports 39.8% of our population gainfully employed as against 34.7% in 1880, a considerable gain despite the introduction of much labor saving machinery. In the 30 year period ending in 1929, the manufacturers of the United States gave additional employment to 3,500,000 persons, adding an average of more than 100,000 workers each year.

To put it another way, the average improvement in technical processes in the manufacturing industries between 1909 and 1925 was such that on an average, 76 men could produce as much as 100 men in 1909; thus, it would appear that 24% of the labor required in 1909 had been displaced by 1925, yet the fact was that manufacturing not only retained the number apparently displaced but made employment for 1,500,000 in addition.

This continual improvement in methods and machinery has done more than that. It has brought many articles—and I need only to point to a few, such as the automobile, radio, electric refrigerators, and things of like nature—within the purchasing power of millions. It has improved the quality of these articles so that they are a much finer product today than they were a few years ago, and their quality is steadily improving year by year. In other words, it has brought within the scope of the average worker's pay envelope more articles than ever has been the case in our history, and continual development and improvement in machinery, I believe, will increase the number of articles and the quality of the articles that pay envelopes will be able to purchase in years to come.

That, I believe, is one of the chief arguments for the justification of the continual improvement of manufacturing methods, *i. e.*, to bring under the umbrella of the average man's purchasing power an increasing number of articles of an improved quality, and as it does, give more and more employment to our population.

Scorching Properties of Rubber Compounds

FOR determining the relative scorching properties of unvulcanized rubber compounds, the Scott Plastometer is a very useful device, according to the R. R. Olin Laboratories, of Akron, Ohio. Steam is circulated through it at 212° F. A milled sheet of the unvulcanized compound, approximately 1 inch square by ¼ inch thick, between sheets of tin foil, .001 inch thick, is placed on the base of the apparatus. The head of the apparatus, carrying a definite weight, is released to compress the rubber sheet to .1 inch thickness. The sample is kept compressed to this thickness for times varying from five minutes to one hour, after which the entire load on the head of the machine is released, permitting it to compress the sample to a thickness which is proportional to the amount of vulcanization taking place in the sample. The thickness under full compression load is read at definite time intervals. A graphic chart of the compression in terms of time furnishes a picture of the relative scorchiness of the compound.

A Correction

DISCUSSING the velocity of sound of vulcanized rubber in his article on "Architectural Uses of Rubber," which appeared in the previous issue of THE RUBBER AGE, the author credited the Mellon Institute with the test that determined such velocity as being of the order of 177 feet per second as against 1,640 feet per second of cork. These tests were conducted by the Smithsonian Institution.

Current Technical Developments

"Pennex"—New Reagent for Reclaiming Process; Catalytically Oxidized Rubber; Refractive Index of Rubber

"Pennex"—Reagent for Reclaiming Process

ONE of the most important recent developments in the alkali process for rubber reclaiming is covered by Patent No. 1,998,449 owned by the Pennsylvania Salt Manufacturing Company, Philadelphia. By the introduction of the proper amount of calcium hypochlorite or other similar reagents into the rubber scrap digesting operation the following advantages are claimed:

For the first time the alkali reclaiming industry is enabled to produce reclaimed whole tire stock free of cellulose as determined by official test.
Thirty per cent less caustic soda can be used.
Twenty per cent less softening oil can be used.
Types of scrap not responsive to the regular alkali process can be successfully reclaimed.
Refining-mill tailings are reduced by about 20 per cent.
Speed of refining is increased approximately 15 per cent.
Over all refining efficiency is substantially improved.

Many chemical equivalents of calcium hypochlorite for use in this process have been investigated by the patentees, and further patents are pending. The Pennsylvania Salt Manufacturing Company is marketing a product containing the correct amount of caustic soda and hypochlorite under the name of Pennex.

Catalytically Oxidized Rubber

ALL of the derivatives so far prepared from rubber, for application in the plastic and allied industries, are thermoplastic in character and their applications are essentially those utilizing this property whether for molding or other purposes, according to W. H. Stevens, who discussed "Plastics Based on Rubber" before the Birmingham (England) Section of the Society of Chemical Industry on February 26. Making mention of chlorinated and sulphonated compounds, well known rubber derivatives, the speaker also discussed a somewhat unexpected application for a thermoplastic derivative (rubber tin halide) recently introduced, viz: a thin sheet wrapping material which has a 20% greater area for a given weight than the better known cellulose materials. An advantage of this material is that it can be readily sealed with a hot iron, thus facilitating wrapping.

Generally, it has been the practice to avoid the oxidization of rubber since its reaction resulted in deterioration to some extent of the tensile strength and elasticity. Recently, however, Dr. Stevens pointed out, catalytically oxidized rubber, made under controlled conditions, is proving a useful material for definite purposes, such as resin bonded moldings, electrical insulating varnishes, paints and lacquers, adhesives, and as starting materials for further chemical treatment, i.e. halogenation. Tests have shown* that by the catalytic oxidization of rubber, solutions of greatly reduced viscosity can be obtained and that these solutions have desirable effects when incorporated in paints and varnishes. Further study has resulted in the production of resins of interesting properties which have been named Rubbone (B.P. 417,192).

The applications of Rubbone result from its resinous and reactive characteristics. Rubbone "B" ($C_{10}H_{16}O$) can be utilized in conjunction with known varnish and lacquer resins, or, in replacement thereof, being compatible with both polar and non-polar solvents. It is especially useful for electrical insulation, where impregnation by a varnish medium is the normal process, because Rubbone can be rendered liquid by heating for the impregnation process, if desired without the use of solvent, and on stoving the resin thermosets to an elastic polymer. At the same time, Rubbone is a "drying resin" and the surface in contact with air during stoving oxidizes and "case-hardens." Rubbone can also be vulcanized by sulphur or sulphur chloride in the normal way. Cold cured or halogenated films are elastic but perfectly clear, according to Dr. Stevens, do not absorb moisture and are believed to be impermeable to gases in contradistinction to soft vulcanized rubber, such as tennis balls, or rubber proofed fabrics, of which airship fabric is an example.

*Stevens and associates, R. G. A. Bulletin, 1933, 15, 600; B. P. 407,038.

Refractive Index of Rubber

THE applicability of refractive-index measurements to the study of rubber has been extended recently by the development of a method of total reflection by the National Bureau of Standards, as reported in the May, 1935, issue of the *Technical News Bulletin*. It is now possible to determine the index not only for translucent samples, but also for samples that are somewhat dark in color and nearly opaque.

Determinations of refractive index were made on crude and purified rubber, mixtures of rubber with various compounding ingredients, and vulcanized compounds of rubber and sulphur, covering the range from soft to semi-hard rubber. Substances mixed with rubber affect the index only insofar as they dissolve in, or enter into combination with, rubber to produce solutions or compounds which differ in index from the rubber.

Fillers, including carbon black, titanium dioxide, whiting, and zinc stearate, do not appreciably alter the index of unvulcanized rubber. Sulphur in solution increases n_D^{25} by 0.0016 for each per cent, and phenyl-β-naphthylamine, by 0.0015 for each per cent. The refractive index of vulcanized compounds of purified rubber and sulphur is given by

$$n_D^t = 1.5190 + 0.00370\ S_c - 0.00035\ (t-25)$$

where S_c represents the percentage of combined sulphur, between 0 and 16, and t, the temperature in degrees centigrade, between 10 and 75° C. Preliminary measurements on compounds containing 19 to 32 per cent of sulphur indicate that the transition from soft to hard rubber is accompanied by a decrease in the slope of the curve relating refractive index to temperature.

Use of Rubber Printing Plates

By W. E. Brown

Sales Manager, Mechanical Roll Division, American Wringer Co.

THE USE OF rubber as printing plates is not new by any means, since rubber has been employed in a limited way for this purpose for many years. If we want to consider the rubber stamp as a printing plate then its use dates back for several decades but, used as a type-high plate, to be repeatedly impressed as would ordinary type, its employment in the graphic arts is comparatively recent.

Aside from type-high rubber surface printing plates there are other plates of rubber in common use for printing corrugated board, wood, and metal. The rubber in this type of plate is one-quarter inch thick including fabric or adhesive back. The plate is cut flat and then tacked or adhered to the special printing press designed to joint the above products, as well as burlap and other fabrics.

Rubber's greatest quality, high elasticity, has been responsible for its slow adaptation as a printing plate. This same quality will continue to limit its use until pressmen learn that it cannot be "squeezed" on the press as can a rigid metal or wood plate.

It has taken printing rubber makers a long time to learn that a printing plate must be harder than a rubber stamp for various technical reasons and a number of manufacturers have failed to produce a successful printing rubber for this reason.

Another error in manufacture is the kind of metal backing employed on which to mount the rubber. If it is too hard to saw easily and tack to wooden bases it proves impractical in a print shop. If it is too soft a metal it cannot be keyed to patent bases without "buckling" at wide areas.

Advantages of Rubber Plates

Rubber printing plates are not considered foolproof by those printers who have and are successfully using them in lieu of rigid plates. They have learned by experience that rubber plates offer many advantages, but also that they require a special technique in handling. Some of these advantages are:

Their ability to print on the roughest papers with full coverage, impossible with rigid plates.

Large economy in ink consumption by reason of better distribution on the press.

Lack of back impression and consequent costly make-ready time.

Quicker drying on the printed sheet by reason of the lesser quantity of ink employed.

Lack of back-offset for the same reason.

Lesser cost of plates as compared with metal or wood engravings.

In many cases the rubber plate may be completed by any printer who can use a sharp knife and straight ruler, and is willing to devote some time to the study of rubber plate cutting. This facility in the shop opens new fields for printing and reduces the cost of rubber plates to a mere fraction of metal plate cost for solid printing areas.

The uses to which rubber plates, hand-cut, may be put are almost limitless in the average print shop that undertakes color printing. The most common of these uses is perhaps the cutting of square color blocks, borders, stars, etc., over which type is to be printed. If good judgment is used in arrangement and color selection a wide variety of effective work can be produced under this limitation.

Next in the order of use is the cutting of large letters to fill out short fonts of wood type necessary for a printing job or the cutting of shaped panels, or initials, to be printed in a second color for decorative purposes.

Instructions For Making

Fig. 1

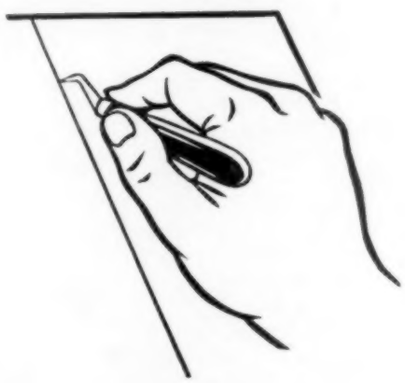


Fig. 3

WE are indebted to The Ti-Pi Company, Davidson Building, Kansas City, Missouri, manufacturers of Ti-Pi rubber printing plate material and cutting tools, for the illustrations reproduced herewith and the following instructions for engraving rubber plates:

The surface of the rubber should first be cleaned with naphtha or gasoline to remove the paraffin coating. The block should be cut ⅛ or ¼" larger than the desired printing area. Then the exact printing area should be outlined with a cutting tool, using a T Square or straight edge (Figure 1). Sizes may be marked off with a pencil or sharp pointed steel.

The next step is to cut clear through the rubber and canvas backing, using a straight cut-off knife as seen in Figure 2. The margin lines should be cut all around the block and the rubber stripped off, leaving a groove between the margins. The operator thus avoids cutting

Following through from the aforegoing experience one will soon learn to cut in finer detail, such as color areas, to fit into zinc or halftone plates and reproduce the beautiful decorations, tailpieces, etc., shown so liberally in paper sample books, and even very effective cover pages that are designed in solid areas.

Small letter cutting, both in reverse and relief, will come last in line of practice, for this type of work is highly professional and requires long practice to accomplish successfully.

It is only natural that the metal printing plate engraver has set up strong opposition to rubber plates but even in the face of this obstacle rubber plates are rapidly being accepted as standard in many shops the world over, and many rubber companies are supplying rubber in sheets for plate making purposes.

Plain Rubber Tint Blocks

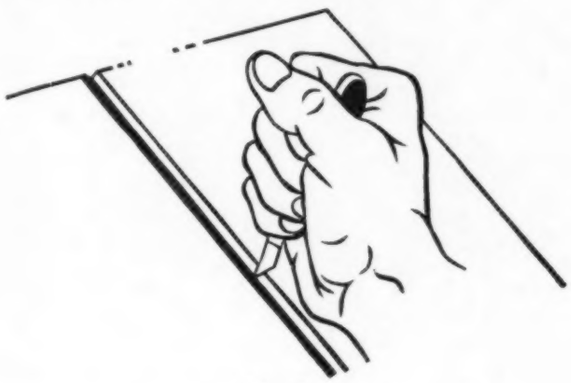


Fig. 2

Fig. 4

the rubber with a saw, rubber dulling saw blades quickly.

Outlining the subject on the rubber may be accomplished by drawing directly on the rubber surface, in reverse; transferring a traced subject from a thin piece of porous paper to the rubber; or by offsetting an image on the rubber surface by placing a freshly printed proof of another cut on it and running through a proof press. The outline is then cut down to the muslin breaker strip with an angle-blade knife (Figure 3), cutting no deeper than to the muslin.

As seen in Figure 4 the final step is to strip off the top ply of rubber (if a 2-ply rubber block is used) from the outside margin with a pair of stripping pliers. This leaves a shoulder all around the block for tacking. If it is necessary to cut the block flush, without a shoulder, the glue will hold the rubber to the block if excessive impression is not used when printing.

In viewing rubber as printing plate material it must be considered from two angles—hand-cut plates and molded plates. The hand-cut rubber plate has proved to be the first of general acceptance because of its low cost and ease of production, while the molded rubber plate requires expensive vulcanizing equipment and very special knowledge of manufacture beyond the making of rubber stamps. The hand-cut plate is made from sheet rubber, while the molded one is from plastic rubber.

In every large printing center there have developed rubber printing plate cutters either in print shops or as independent organizations. Some of these organizations employ as many as twenty to thirty expert rubber plate cutters with full photographic art and molding facilities.

A wise course for the printer unfamiliar with rubber plate cutting and printing is to start in a small way and, by actual practice, develop the art of cutting. Such work as may be beyond his cutting capacity should be turned over to a competent rubber cutting concern which will produce the work, ready for the press, at a large saving under cost of finished drawings and etchings.

During this process the printer will automatically learn the technique and the limits of rubber plate cutting and, at the same time, develop a natural method for printing rubber plates which is somewhat different from printing rigid plates.

Molded rubber printing plates are rapidly coming to the fore and it seems more than possible that this form of plate will eventually supplant the electrotype.

The imperative necessity for duplicate plates in printing multiple forms by the flat-bed printer, coupled with the comparative high cost of electrotypes seems to justify the above statement. Add to this the strong competition between offset high-speed printing and slow flat-bed printing, with the advantage of fine work on the offset side, one can realize the need for rubber plates that would somewhat even up the two methods.

It must not be inferred by any of the foregoing that the making of either hand-cut or molded rubber printing plates is a completed art. Up to now the hand-cut plate has been limited to relatively broad areas and coarse lines and cannot compete for fine detail with the etched metal plate in line work, Ben Day patterns or halftones. In molded rubber plates the smallest of type, fine lines, Ben Day screens and halftones are proven possibilities.

Knowledge of Printing Necessary

The rubber manufacturer who would produce printing plate material with reasonable hope of broad acceptance for his product should view the problem from the printer's angle more particularly than from the rubber angle. Without a full knowledge of printing practice, machinery, paper stocks and traditions, he cannot hope to produce a material that will prove satisfactory and it must be remembered that a single failure of a plate or set of plates on any printing job would prove highly expensive to the printer and perhaps discourage him from a second trial.

There are many printers who have had sad experience with unsatisfactory rubber plates and many others who will be slow to adopt this form of plate. On the other hand, there are thousands of printers who would be interested in rubber plates if they could be shown a practical material and method, both for plate making and plate printing. The one is as important as the other.

There is a tendency among buyers of printed matter to purchase their plates separately from the plate maker and turn these plates over to the printer for printing only. This practice has grown out of the large number of photo-engravers developed in printing centers, an immense industry within itself.

This latter class of plate buyers is probably greater in

number than the printers themselves and represent a greater plate buying volume than do the printers.

The existing high cost of metal printing plates has had a very definite effect on the reduction of color printing volume. This places rubber plates in a very advantageous position if means can be found to capitalize the idea under present demand.

Considering the rule-of-thumb methods of making rubber printing plate material up to the present there is a relatively large demand. This is positive proof that there is a natural demand for a right substitute for rigid printing plates.

There will probably evolve out of the situation one or a few rubber printing plate makers who will produce a quality product acceptable to printing companies, just as there are comparatively few makers of etching zinc and copper material for photo-engravers.

It may require considerable time and effort to compel acceptance of the rubber plate among the big volume printers. This class represents a very small percentage of the total number of printers in the United States and Canada.

The big market for rubber plate material is among the medium size and small printers located both in general printing centers and more particularly in small towns where photo-engravers are not conveniently available, and where the printer is ingenious enough to cut his own plates and make a handsome added profit for his pains.

Physico-Chemical Properties of Latex

BECAUSE of varying behavior latex may be termed both hydrophobic and hydrophilic, according to E. W. Madge, who discussed the physico-chemical properties of latex before the Institution of the Rubber Industry on February 18 at the Engineers' Club, in Manchester, England. From the point of view that latex "creams" under gravity, that the particle carries an electric charge and depends partly on this charge for its stability, and that the swelling of the actual particle in water is very small, it may be termed hydrophobic. However, Mr. Madge stated, in view of the behavior of latex with respect to dehydrating agents, the manner in which it forms aqueous voluminous gels, and its reaction to shearing forces, it may also be classified as hydrophilic. Its hydrophilic character is conditioned by the material adsorbed on the surface of the particles and is more pronounced in compounded and treated latices.

With latex, as with many other colloids, the shearing force is not a linear function of the velocity gradient, but varies in a more complex fashion, particularly for low rates of shear. The phenomenon is not confined to latex, but is exhibited by many other colloids and suspensions, the anomalous viscosity associated with low rates of shear being termed "the structural viscosity." This may be noticed, for example, in dipping, particularly with some thickened mixings where the rate of withdrawal is slow, the withdrawal times apart from drainage effects affecting the effective viscosity and the weight of the deposit. Hence, latex and many other colloids do not behave like normal liquids in their flow properties, but like pseudo-plastics.

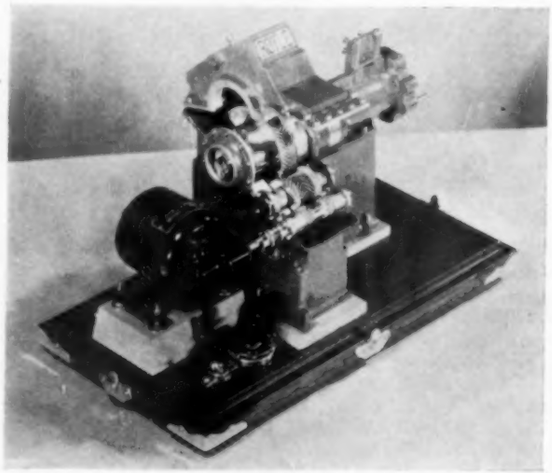
Sixty per cent. is a popular concentration for the higher concentration latices prepared by processes other than those depending on evaporation, as such processes depend on the relative movement of the latex particles and the serum. According to the usual analysis, the resistance to motion of a particle for low velocities is directly proportional to the viscosity and the radius of the particle, and the force producing the motion is proportional to the cube of the radius of the particle and the difference between its density and that of the serum. Consequently, other things being equal, the lower the viscosity of the latex the better the separation.

In common with other colloidal suspensions the viscosity of latex mixings decreases rapidly with rise in temperature. The relation is probably a logarithmic one, of the form discussed by Andrade for liquids, $\log. \eta = a + b/T$. The decrease of viscosity with temperature has not been used to any great extent, although a recent patent claims that an increased separating efficiency in the centrifuging process may be obtained by heating the latex due to the reduction in viscosity thereby obtained. The latex system consists of particles suspended in an aqueous medium prevented from coalescing (*a*) by their charge. (*b*) by the adsorption envelopes on their surfaces. The methods by which the viscosity of a mix may be altered by agents, therefore, fall into three groups, by (1) influencing the charge on the particle, (2) altering the magnitude of the protective envelope, and (3) altering the viscosity of the aqueous serum itself. The three groups must necessarily be somewhat interconnected, but the three effects may be clearly separated. The effect of ammonia on the viscosity of a latex of the addition of ammonia results in the viscosity falling sharply up to approximately 0.05 per cent. and still decreasing up to an ammonia content of 0.10 per cent.

The modification of the nature and amount of the adsorption layer can be done in a number of ways. The hydration of the adsorption layer can be reduced by the use of small quantities of dehydrating agents with a diminution in viscosity; or by treatment with such materials as albumen, casein and hæmoglobin, in which case the viscosity is strongly increased. An outstanding example of the effect of heavy hydration of the protective envelopes is afforded by the special case of flocculated rubber precipitates prepared from latex.

Model of New Royle Tubing Machine

A COMPLETE miniature on a 1/10 scale has just been made by John Royle & Sons, Paterson, N. J., to represent their newest line of herringbone-gear tubing machines. This model, only 12 inches long, is an exact duplicate in detail and finish of a standard 8-inch production machine. A tiny motor with rheostat control operates it at speeds of 20 to 120 r.p.m. of the screw. Better than pictures or description, this little piece of fine craftsmanship contains all elements of the Royle tubing machine in correct proportions. It clearly exemplifies the Royle trend toward heavier construction of tubing machines and more powerful drives. This model will shortly be making its appearance in the company's sales work.



New Equipment

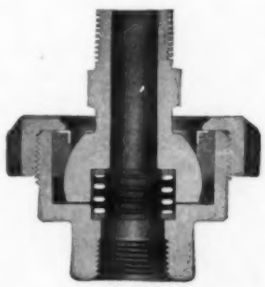
DeLuxe Hand-ee Grinder

SMALLER in size than anything yet produced in high speed electric tools, the DeLuxe Hand-ee Grinder, measuring 6" long overall and 1⅝" in diameter, has been brought out by the Chicago Wheel & Grinding Company,

1101 West Monroe Street, Chicago. Although the tool has a speed of 25,000 r.p.m., with ample power to drive a number of different accessories, its weight has been held down to fifteen ounces through the use of new materials in its construction. Due to a new type of fan mounting, heat, highly objectionable in high speed electric tools, is said to be entirely eliminated. Because of its light weight the new grinder can be held as one holds a pencil (see illustration). Its speed and power permits the user to mark materials almost as rapidly as he can write with pencil or pen. Its uses include: cleaning casting molds, reaching inaccessible places in castings, and removing difficult deposits with a wire brush. With the addition of polishing wheels it can be used for polishing any type of metal. It can also be used for smoothing and sanding materials by the use of a novel sanding drum. In all, its manufacturers claim 1,001 uses for the DeLuxe Hand-ee Grinder.

Improved Barco Swivel Joint

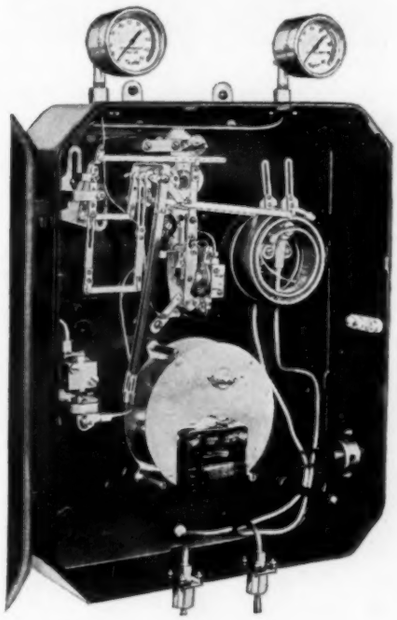
AN IMPROVED swivel joint, for use on platen presses, tire and tube molds, and similar machinery, to connect piping between moving parts, has been brought out by the Barco Manufacturing Company, of Chicago, Illinois. The new swivel joint incorporates a metal washer, or bearing, at each end of the spring, eliminating the spring



wear on the two major parts of the joint, i.e., the ball and the casing. Use of these washers is said to reduce possibility of spring breakage, and to prolong the life of the major portions of the joint.

Taylor Reset Controller

INCORPORATING the advantages of the "Fulscope" control mechanism, the Taylor Reset Controller has been introduced by the Taylor Instrument Companies, Rochester, New York. An outgrowth of the so-called "differential controller," the new instrument controls a temperature, pressure, rate of flow, or liquid level, in a predetermined relation to some other similar characteristic. It can be used on all applications where a fixed differential must be maintained between two variables, one of which is under control, or where it is desirable to change the control point of a process in accordance with a predetermined ratio to a secondary process or condition. Readily adjustable to meet a variety of requirements the new controller permits control point changes in an equal variety of ratios between controlling and resetting systems. The maximum ratio value attainable is 5 to 1, or, in other words, the control point can be shifted a maximum of 5 units for each unit change in the resetting system. For temperature applications the device may be mercury-, vapor,- or gas-actuated. The chart is rotated by an electrically driven clock movement. Control is maintained



in the usual manner by regulating the flow of air pressure to the diaphragm valve in the controlling medium line in response to changes in the apparatus under control. A constant 25 lb. per square inch air pressure is specified by the company for the most efficient operation of the new instrument.

Farrel-Birmingham Laboratory Mill

FEATURING a drive contained within a high base to conserve floor space, at the same time providing a convenient working height of 3′ 10″ from the floor to the top of the rolls, without the necessity of mounting on a table or other sub-structure, Farrel-Birmingham Company, Inc., Ansonia, Connecticut, has introduced a new 6″ x 13″ laboratory mill. It is driven by a gear motor with the drive pinion mounted directly on the output shaft, thus eliminating any separate reduction gears. With the gear motor located in the base of the unit, the overall length is

approximately half that required for units with the motor and drive mounted in line on the same level as the mill. This laboratory mill has the usual equipment found on larger mills for factory use, including Farrel chilled iron rolls, housings of Meehanite, cut spur connecting and drive

gears enclosed in sheet metal guards and running in oil. A new feature is the automatic guides which are self-adjusting with the adjustment of the rolls. The adjusting screws are also provided with vernier scales to indicate the exact setting of the rolls. A safety trip over the rolls operates a magnet disk brake built into the motor for quick stopping in case of emergency. The base of the unit is of welded steel construction.

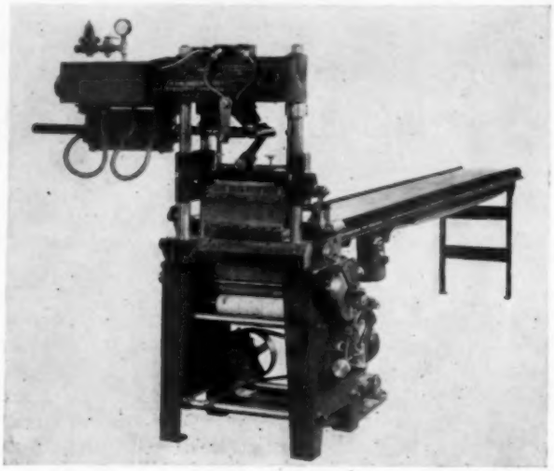
New Tag Diaphragm Valve

ONE of the latest developments in the valve line featured by the C. J. Tagliabue Manufacturing Company, Park and Nostrand Avenues, Brooklyn, New York,

is a new long range throttling top. This construction is said to incorporate several new features of design including a novel arrangement for adjusting the spring pressure. The member in contact with the bottom of the spring does not turn when the adjusting feed screw is turned but guided by the two vertical fins of the spider arms merely moves up or down. Thus spring adjustment does not tend to wind up the spring or disturb its normal characteristic in any way.

Improved Guillotine Rubber Cutter

DESIGNED to automatically cut cured and uncured rubber stock to accurate lengths from 0" to 14" inclusive, the Black Rock Manufacturing Company, Bridgeport, Connecticut, has announced an improved model of their guillotine rubber cutter under the trade term of Model 4-KAT. Depending upon the quality and size of the piece, or pieces, to be cut, the improved model requires from 40 to 100 pounds of air pressure for operation. It will cut any piece, or number of pieces, that will fit in a cross section of 3½" x 13". There is ample loading capacity since lengths of stock up to 12 feet may be loaded



on the conveyor feed belt. Through the use of a variable speed drive, a ¾ h.p. motor being used for power, 15 to 50 cutting strokes are obtained per minute. The motor has an integral electrically operated brake allowing the operator to stop the cutter at any part of its cycle. A new feature is a novel method of pneumatically operating the knife said to result in an improved quality of cut. Equipment supplied with the improved guillotine rubber cutter includes two knives, two brass cutting blocks, a pressure regulator, an air valve oiler, an electrically operated air valve, a pressure gauge, motor controls, variable speed pulley drive and suitable wrenches, among other items.

Garrison Garfire Gun

FOR USE in all types of industrial factories, as well as homes and offices, the Garrison Engineering Corporation, Waterbury, Conn., has added the Garfire Gun to its line of fire extinguishing equipment. Three pounds in weight, the "gun" makes use of the patented Garrison DuGas dry compound, and is stated to be easily operated. It consists of a pump gun plus the dry compound projector, both made of solid materials, with an exterior shell of brass. A turn of the pump handle unlocks the instrument and makes it ready for instant use. Retailing

at $3.75, refills of the Garrison DuGas compound may be secured in three-pound packages, or in projector heads ready to be clamped onto the Garfire Gun.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry

THE ECONOMIC CHARACTERISTICS OF RUBBER TIRE PRODUCTION. By Leonard E. Carlsmith. 230 pp. $4.00.

(Available from the Book Department of THE RUBBER AGE*)*

Prepared and written in keeping with the requirements for the degree of Doctor of Philosophy, under the Joint Committee on Graduation Instruction, Columbia University, New York, this book records the results of an exhaustive study of the tire manufacturing industry in the United States. The author's purpose, and accomplishment, was to ascertain the nature of the more important economic characteristics of the industry, and where possible to measure them. Since graphic charts of these characteristics have been sadly lacking in the past the author was required to delve deeply into available information and construct his own graphs and charts which are liberally used throughout the book. Because crude rubber is so intimately connected with the tire industry, both technically and economically, a chapter is devoted to it, including price fluctuations, supply and demand, statistics, and other variations. In his introduction the author candidly states that "the results of this research do not lead to a single conclusive proposition." Instead, he continues, there are presented "a number of derived relationships and trends . . . all varying in importance and significance." Because of the nature of this work only a limited supply of the books are available. Due to its combined value in presenting both theory and hitherto unpublished fact the book merits a place in rubber and rubber tire technical libraries.

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CAMACHINES. Issued by the Cameron Machine Company, 61 Poplar Street, Brooklyn, N. Y. 56 pp.

Primarily a catalog of paper slitting and roll-winding machines, which the company has been producing for more than thirty years, it is of interest to the rubber industry because many of these machines are also used for slitting fabrics, rubber, artificial leather, etc. Each page in the catalog is used to illustrate and describe another Cameron model, with minute specifications given in all instances. A two-page chapter is also devoted to a discussion of various slitting methods in use.

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1935 YEAR BOOK OF THE TIRE & RIM ASSOCIATION. Published by the Tire & Rim Association, Inc., 1401 Guarantee Title Building, Cleveland, Ohio. 86 pp. $2.00.

This latest issue of tire and rim statistics, published annually by the Association, brings up to date, through April, 1935, specifications as adopted by it for passenger car, truck and bus, motorcycle, airplane, tractor and trailer, solid and cushion, and other miscellaneous tires and rims. The book is replete with drawings and tables of varied specifications, the date of adoption or revision being given in each case. Association recommendations are also part of the 1935 edition.

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THE ADVENTURE OF PROGRESS. By Hartley W. Barclay. Published by Hartley W. Barclay, New York City. 64 pp. $1.00 per copy.

Written with a keen understanding of the efforts expended by the Roosevelt Administration by the spending of billions of dollars in the name of recovery, the author vigorously protests the artificial methods of interfering with mechanization. He is firmly of the conviction that "Research and Invention are two modern forces which are stronger than Codes or any other trade pacts." He places his faith in an eventual return to prosperity on the fact that there is a back-log of over eighteen billion dollars in industrial supply and machinery needs which is "creating a growing demand for skilled labor." The author also defines the "Fourteen Lessons of Recovery" including those of taxes, industrial management, production, corporation profits and labor. A series of economic charts is part of the book. It is an excellent review of the basic principles of industrial economics.

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ACCURATE WIRE CLOTH. Issued by the Newark Wire Cloth Company, 351 Verona Avenue, Newark, N. J. 4 pp.

Depicting exterior and interior views of the company's plant, which is exclusively devoted to the making of wire cloth products, this folder also illustrates and furnishes data on typical weaves and meshes, testing sieves, filter cloth, and bottom strainers. A condensed price list is also included.

ADAMSON STANDARD AND SPECIAL EQUIPMENT. (Supplementary to the Adamson General Catalog Number 66). Distributed by the Adamson Machine Company, Akron, Ohio.

Illustrating and describing several new developments sponsored by the company since the release of its general catalog, this folder is issued as a supplementary. Standard and special vulcanizers, platen presses, extruders, and other types of machinery for use in the rubber industry, with a brief, concise description of each model, are illustrated. New principles in the design of various presses are discussed in relation to their respective uses. Printed in two colors, this booklet is of value to every factory and works manager.

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CABLE ACCESSORIES. Published by the General Electric Company, Schenectady, New York. 78 pp.

Published as a companion book to "How to Make Cable Joints," issued last year by the company, this latest book lists and describes all of the materials required for cable work, including joints, connectors, terminals, reservoirs, etc. In addition to drawings and specifications detailed information on prices is given. To manufacturers and individuals engaged in work involving insulated cable the book should be useful in making up jointing standards and for general reference.

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1935 PACKAGING CATALOG. Published by the Breskin & Charlton Publishing Corporation, 425 Fourth Avenue, New York City.

With 132 of its total 312 pages devoted to editorial features relating to practical information on packaging, in all of its variations, the 1935 edition of this annual catalog is one of the finest published since its inception in 1929. In addition to the general information the book contains a catalog of machinery equipment and supplies used in the packaging industry as well as a complete buyers' guide. Covering as wide a range of subjects as it does, this catalog merits a place in the files of every purchasing agent in the rubber industry whose company merchandises its finished products in packages of any type.

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FUNCTIONS OF THE CONTROLLER. Published by the Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City. 36 pp.

A composite picture of the duties of the present day controller, including an exact definition of his rights and duties, is given in this booklet. As source information the compilers studied the practices of many industrial, commercial and mercantile organizations. Although most corporate controllers and office managers are familiar with their duties, reading of this booklet will broaden their scope.

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MICA. INFORMATION CIRCULAR 6822. By F. W. Horton. Distributed by the Bureau of Mines, Department of the Interior, Washington, D. C. 56 pp.

Issued in the form of an address this paper covers the salient features of the occurrence and mining of sheet mica in the United States and the preparation of mica for market. It also includes the results of a study of the physical properties of domestic and foreign micas. These results answer many questions as to the suitability of various micas for particular purposes, including its use in the rubber industry.

Editorial Comment

Business as Usual

ALTHOUGH the epoch-making decision of the Supreme Court on May 27 holding the codes of fair competition unconstitutional relieved industry in general from rigid Federal rules and regulations, the rubber industry has shown no indications of abusing the new found freedom. Despite the clamor raised by the American Federation of Labor, which lists the rubber industry among others, alleging wage cuts and increased hours, practically every rubber manufacturer, large and small, has heeded the requests of Mr. Richberg, of the Roosevelt Administration, and Mr. Sibley, president of the Chamber of Commerce of the United States, to maintain current wage and hour scales.

All pessimistic reports to the contrary, American business has made substantial gains in the last two years. Proof of this is found in increased employment and in financial reports. It is now up to industry to maintain these gains by voluntary action with respect to codes of fair competition, since Federal enforcement is suspended by virtue of the Supreme Court's decision.

It must be remembered that the all-important decision wiping out the codes caused no destruction of property, no damage to our system of government, no revolutionary results, nor injured existing methods of legitimate business. It merely removed an objectionable halter from the neck of business. It seems good practice to us to merely absorb the decision of the Supreme Court by hanging out a "Business as Usual" sign, and continuing present arrangements until such time as the full intent of the decision is properly thrashed out and absorbed.

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A Lesson for Labor

THE resumption of operations at the Mogadore (Ohio) factory of the India Tire Company should serve as an excellent lesson to Mr. William Green and his American Federation of Labor. India Tire was the only 100% unionized tire factory in the United States. It recognized the union in February, 1934, shortly after going through a complete reorganization. In an effort to capitalize on its union recognition India Tire adopted a union label which was placed on all of its finished products. Unfortunately, according to the company's statement, the union label proved more of a liability in competitive selling than an asset. Although there was a slight gain in the number of individual purchasers of union label-bearing India tires, sales to commercial dealers fell off substantially.

A paradoxical situation existed in the shut-down of the Mogadore factory. It was originally closed by the India Tire management with the statement that the company could not operate on a profitable basis and still meet union demands. The union declared it a lock-out and established a picket line around the factory. Later the management stated a strike existed. But whatever it may have been, the union workers overwhelmingly voted among themselves to return to work on an "open shop" basis. The management, we feel, showed considerable wisdom in offering to treat with the American Federation of Labor local as a negotiating agent. However, in the future union dues will not be deducted from the worker's pay envelopes, but will have to be obtained from them by direct collection methods.

The India Tire Company has had more than its just share of difficulties along both labor and financial lines. Since its reorganization it has been threatened with court actions to send it back into receivership. A negotiated loan of $190,000 from the RFC was held up pending settlement of its labor difficulties. These are but two instances. Now, with operations resumed on an "open shop" basis, and with the government loan assured, India Tire should enter a period of activity and profits.

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A Rubber Pool?

CERTAIN British interests, disappointed in the results so far attained by the Restriction Scheme, now on the eve of its first anniversary, are proposing a rubber pool to force an immediate increase in prices. At the time the Dutch and British interests formed the International Rubber Restriction Committee a pivotal point for rubber was intentionally avoided. Because of the number of native planters the Dutch interests would be satisfied with a steady price of about 18 cents per pound for crude, but British interests, with heavy capital investments in plantations, visualize a 25 cent price.

As pointed out many times, the restriction scheme is working steadily—but slowly. Unsettled world conditions, particularly in the United States, have held the price down to its current 12 cent level. At the present rate of restriction world stocks will be lowered by less than half in the next twelve months providing consumption reaches approximately 1,000,000 pounds in 1935, as expected. Proponents of a rubber pool claim that it would produce results in two or three months that otherwise will take more than a year.

Fortunately for consumers, Dutch interests are heartily opposed to a pool. They fear that it would lead to a sharp difference in opinion among controlling interests, as it would. Furthermore, a buffer pool would have to shroud its actions in secrecy, whereas all speculation at present is done more or less in the open. They are also convinced that rubber restriction in its present state is sufficiently artificial for its intended purpose. It remains to be seen whether Dutch patience will outlast British haste.

CURRENT • NEWS
of the Rubber Industry

JUNE, 1935

Industry Is Undisturbed by Supreme Court Decision With RMA Reorganization Planned for Early Future

Association Expected to Revert to Former Standing Prior to Inception of Codes—Labor Situation Is Calm Despite Cincinnati Court's Election Decision

CONTRARY to all earlier predictions the rubber industry has undergone no drastic changes as the result of the decision of the Supreme Court on May 27 in the Schecter poultry case which invalidated the entire code structure of the NRA on the grounds that the code-making provisions of the act constituted an invalid delegation of power by Congress of its authority to legislate by granting code-making powers to persons wholly disconnected with the legislative functions of the government. The entire industry is marking time, with practically no changes made in wages and hours, despite the charge of the American Federation of Labor on June 6 that the rubber industry was one among a number violating labor standards.

Rubber manufacturers in and around Akron are very reluctant to make formal statements with regard to their positions in the face of the collapse of the rubber codes. One company president, who refused to be quoted, is cited as stating that: "We are going along with the wage and working condition standards we adopted under the NRA codes, but manufacturers are agreed there is no point to making a formal statement."

Among the smaller companies, it is reported, every effort is being expended to maintain present conditions. As Smith M. Johnson, president of the Johnson Rubber Company, Chardon, Ohio, puts it "It would be a shame to go back to starvation wages. A cut would mean hardships in many ways. We shall make every effort to avoid it." Mr. Johnson made this statement on June 6 while stating that NRA codes wages would be continued at his plant.

It was natural that the Supreme Court decision threw into temporary confusion the various hearings scheduled to be heard before government administrators. Because of the decision the hearings which were scheduled to begin on June 10 on charges brought by the Federal Trade Commission against the Rubber Manufacturers Association, and certain fire hose making members, on the complaint of price fixing and other unfair methods of competition, are at present in a state of indecision. It is expected, however, that within the next several weeks the matter will be clarified and a more definite statement made as to the probable course of events.

RMA to be Reorganized

At the same time it became known that a virtual reorganization of the RMA is under way. In all probabilities the Association, which has been acting as the code authority for the industry, will revert to its former set-up prior to the introduction of the NRA with its code rules and regulations, making any necessary changes in its organization to meet current conditions in the industry.

It is understood that closer cooperation between Association members will be attained by a revision of the directorate, with each division represented on the board. Since the court's decision members of the Association have held a series of conferences which will shortly result in the proposed reorganization as described.

Labor Board's Orders Dismissed

Prior to the Supreme Court's decision in the Schecter case, Akron industry was awaiting the decision of the United States Circuit Court of Appeals, at Cincinnati, with regard to the right of the National Labor Relations Board to order employe elections in rubber factories. The Board ordered such elections held in the Goodrich and Firestone plants, both companies filing appeals with the Cincinnati court contesting that the Board had no such right. On June 7 the three judges of the Appeals Court, in a two-paragraph opinion, without giving any detailed reasoning as is customary, pointed to the Supreme Court ruling. and declared the election orders invalid.

The decision of the Cincinnati court was merely one of a formal nature, since President Roosevelt announced on June 1 the dismissal of 411 pending court cases with regard to code enforcement, among which was the one involving the right of the Labor Board to order employe elections in the Firestone and Goodrich Akron factories.

Despite the Cincinnati court's decision the labor truce recently effected between Goodyear, Goodrich and Firestone and the United Rubberworkers' Council, remains undisturbed. One of the main clauses of this truce, effected on April 13, was that no strikes or lock-outs would be called by the labor unions until after a decision was reached in the employe election controversy, which has now been decided in favor of the manufacturers. The remainder of the agreement is still operative, with both sides expressing willingness to continue under its terms.

According to rubber union leaders the Cincinnati court's decision was expected in view of the NRA collapse. It is the opinion of these leaders that rubber workers who formerly looked to the Roosevelt Administration for support will now join union ranks and swell union membership. According to S. H. Dalrymple, president of the Goodrich local, no major grievances now exist that would cause a strike. "Naturally," he stated, "we shall continue to strive for the principle of majority rule and the opportunity to hold an employes' election."

Drop Firestone Suit

Still another effect of the epoch-making decision with regard to the NRA was the dropping of the suit brought by the National Relations Board against the Firestone Tire & Rubber Company which sought to remove the company's "blue eagle" on the grounds that Firestone financed its so-called "company union." Firestone obtained an injunction in this instance, and was awaiting the filing of a reply by the government setting out its reasons for removal of the "blue eagle" when the code-making provisions of the NRA were invalidated.

New York Group Picnic

The Annual Summer Picnic and Outing of the New York Rubber Group will be held on Saturday, June 15, at the Alps Castle, Alps Road, Preakness (Paterson), New Jersey. Activities are scheduled to start at 9:00 A. M. Highway 23 from Newark leads straight to the grounds. Highway 4, on the New Jersey side of the George Washington Bridge, also leads to Preakness. Arrangements have been made to meet those coming by train at Paterson. Both Erie and Lackawanna trains (out of Hoboken) stop at Paterson where cars will be waiting to take train arrivals to the Alps Castle. Tickets for the combined outing-picnic are $2.50 each. J. Miscall, Flintkote Company, East Rutherford, N. J., is chairman of all activities.

REOPEN INDIA FACTORY ON "OPEN SHOP" BASIS

Closed on April 27 by the management because "we cannot accede to the union leaders' demands for unwarranted and impossible wage scales," the factory of the India Tire Company, at Mogadore, Ohio, was reopened on May 22 after workers had voted to return on an "open shop" basis.

After closing the factory down W. G. Klauss, India Tire president, appealed to the workers to vote to return on an "open shop" basis because of resistance met in the sales division of India products due to the "closed shop" condition. The company was the only 100% unionized rubber factory in the country, and had adopted a union label on all of its finished products.

After establishing a picket line around the factory, although the management made no effort to run the plant, the India union local, affiliated with the American Federation of Labor, held a meeting on May 12 and voted 141 to 33 to continue their "closed shop" plan at the factory. Ten days later, however, a second vote conducted by the union resulted in a 117 to 43 decision to drop its "closed shop" agreement and return to work under "open shop" conditions.

The India Tire management agreed to continue to recognize the American Federation of Labor as a negotiating agent, and promised to put the 200 workers employed at the time the factory was closed down back to work without discrimination. President Klauss also predicted an early expansion program.

GOODYEAR MAKES OFFER FOR KELLY-SPRINGFIELD

A proposal to form a new corporation to take over the business and assets of the Kelly-Springfield Tire Company, now operating under a trusteeship, was submitted to Federal Judge W. Calvin Chestnut, at Baltimore, on May 14 by the Goodyear Tire & Rubber Company, after a series of meetings with Kelly-Springfield directors.

Under the Goodyear proposal there would be paid for the business and assets of Kelly-Springfield to the holders of the notes and stocks of the existing company cash and common stock as follows: to the 10-year 6% subordinate notes, 75% of the par value thereof in cash; to the preference stock, $10 a share in cash and 2 shares of Goodyear common stock for 5 shares of Kelly-Springfield preferred stock; to the common stock, $1.00 a share in cash and one share of Goodyear common stock for 25 shares of Kelly-Springfield common stock.

In totals, this means that the present Kelly-Springfield security holders would receive approximately $3,000,000 in cash and approximately 50,000 shares of Goodyear common quoted at the market at around $19.00 per share, for a complete total of about $4,000,000.

A plan for a different distribution of the cash and securities offered by Goodyear was filed on May 24 with the Baltimore Court by Robert J. Levy, a Kelly-Springfield noteholder. Mr. Levy proposed that noteholders receive 85% of par value in cash instead of 75% as provided in the original Goodyear proposition, preferred stockholders would receive $12.00 in cash and three-fifths of a share of Goodyear common stock for each share held, while the common stockholders would receive 50 cents in cash and one-fortieth share of Goodyear common for each share of Kelly-Springfield. All assets remaining after this distribution would be distributed to holders of common stock, according to the revised plan.

Mr. Levy also proposed another reorganization plan which provided for the issuance of new 6% notes, due on December 1, 1938, to noteholders to 85% of par. Preferred stock would receive one share of new $20.00 par, 6% preference stock and one-fourth share of new common stock for each share of common held, while the common would receive one share of new common for each ten shares of old held. A voting trust would also be created giving to noteholders the controlling vote until the new notes were retired.

Still another reorganization plan was submitted by a stockholders' committee which called for the exchange of each present $1,000 note for eight shares of new $6.00 cumulative convertible first preferred and ten shares of new common stock. Other additional exchanges of new stock would be made for old shares now held.

Although the original Goodyear plan is being contested by a stockholders' committee headed by Spruille Braden, of New York City, it is believed that it will be approved by creditors and stockholders in the early future, according to counsel for Kelly-Springfield. Edmund S. Burke and Thomas B. Finan are now running the Cumberland, Maryland, factory as trustees.

Average Salary—$1,076

According to figures compiled by the Federal Census Bureau, the average annual wage of Akron rubber workers employed in the manufacture of tires and tubes, on either part or full time, during 1933 amounted to $1,076. Workers employed in the manufacture of other rubber goods in and around Akron, on either part or full time, received an average wage of $808 for the same year. The figures also reveal that labor received approximately 35% of the value added by manufacture in 1933.

Goodrich Upheld on Molds

The Ohio Supreme Court on May 28 refused to review the decisions of the Summit County Common Pleas and Appeals Courts, both of which had previously decided that tire molds owned and used by the B. F. Goodrich Company, Akron, were "dies" and therefore non-taxable. The Ohio State Tax Commission has been attempting to collect taxes on such molds filing suit against Goodrich, and its Miller subsidiary, as a test case. The decision of the Ohio Supreme Court will save thousands of dollars for rubber manufacturers in the state.

Bata Building Montreal Plant

The bolstering of tariffs on rubber goods entering Canada, recently put into effect, was instrumental in the decision reached by the Bata Rubber Footwear Company of Prague, Czechoslovakia, one of the largest European rubber manufacturing companies, to erect a rubber factory at Montreal. The new factory is expected to be completed and in operation sometime this month. The announcement of the Bata decision was made by William H. Herman, sales manager of the Rubber Trading Company, Montreal.

APRIL CONSUMPTION IS 4.9% MORE THAN MARCH

Consumption of crude rubber by manufacturers in the United States for the month of April amounted to 44,714 long tons, which compares with 42,620 long tons for March, 1935. April consumption shows an increase of 4.9% above March and practically no change as compared with April, 1934, according to statistics released by the Rubber Manufacturers Association. Consumption for April, 1934, was reported to be 44,853 (revised) long tons.

Imports of crude rubber for April were 43,545 long tons, a decrease of 1.1% below the March figure of 44,041 long tons, and 4.6% under 45,662 long tons imported in April, 1934.

Total domestic stocks of crude rubber on hand April 30th are estimated at 334,954 long tons, which compares with March 31st stocks of 338,700 long tons and 351,073 long tons on hand April 30th, 1934.

The participants in the statistical compilation report 37,651 long tons of crude rubber afloat for the United States ports on April 30th, compared with 44,485 long tons afloat on March 31st and 56,251 long tons afloat on April 30, 1934.

April reclaimed rubber consumption is estimated at 10,466 long tons; production 10,315 long tons; and stocks on hand, April 30, 1935, 20,521 long tons.

TIRE SHIPMENTS GAIN 27.9% OVER FEBRUARY

Shipments of pneumatic casings for the month of March, 1935 amounted to 4,204,131 casings, an increase of 27.9% over February, but was approximately ½% below shipments made in March a year ago, according to statistics released by the Rubber Manufacturers Association.

Production of pneumatic casings for March were reported to be 4,345,581 casings, a decrease of approximately 1% under February and 16.1% under March, 1934.

Pneumatic casings in the hands of manufacturers on March 31st amounted to 11,675,268 units, an increase of 1.3% above stocks on hand February 28th and practically no change as compared with stocks on hand March 31, 1934.

The actual figures are as follows:

PNEUMATIC CASINGS

		Shipments	*Production*	*Inventory*
March,	1935	4,204,131	4,345,581	11,675,268
Feb.,	1935	3,287,394	4,382,663	11,529,561
March,	1934	4,222,962	5,180,122	11,650,661

INCREASE IMPORTS OF CRUDE RUBBER AND LATEX

According to the Department of Commerce, Washington, D. C., United States imports of crude rubber and liquid latex during the first three months of 1935 amounted to 302,416,390 pounds, valued at $35,766,522, which was 6.6% greater in quantity than the 283,609,052 pounds valued at $20,130,802 in the same period of 1934.

The value of these imports increased 77.7 per cent. This increase is explained by the higher market value being reflected in import values during the current year, the unit value being 11.83 cents per pound against 7.1 cents in the 1934 first quarter.

Less liquid latex was imported than in the 1934 period, the figures being 6,071,428 pounds valued at $821,820, compared with 7,044,596 pounds valued at $690,331.

CARBON BLACK INDUSTRY AWAITS OFFICIAL ACTION

According to the terms of the Gas Wastage Bill, which affects the manufacture of carbon black in the Panhandle section of Texas, and which was signed by the Governor of the state on May 1, broad discretion "in administering this law" is vested in the Texas Railway Commission, which is further authorized to "adopt any and all rules, regulations or orders which it finds necessary to effectuate the provisions and purposes of said law." The action of this commission is now awaited by the carbon black manufacturers with interests in Texas, as well as carbon black consumers.

Briefly, the Gas Wastage Bill specifically prohibits the use of any gas for the manufacture of carbon black unless the natural gasoline content is first extracted; prohibits the use of sweet gas for the manufacture of carbon black under any conditions; and prohibits the operation of any well in such a way as to cause it to produce more than 100,000 cubic feet of gas to each barrel of oil unless the gas is utilized for one of the purposes authorized by the commission for that particular type of gas. However, it is immediately pointed out by carbon black manufacturers, that any change from sweet gas to sour gas will not affect the quality of carbon black produced by manufacturers having the "necessary background of experience."

There is little chance that production of carbon black in the Panhandle will be curtailed in any way by the Act. As Edmund Billings, vice-president of Godfrey L. Cabot, Inc., points out, despite a possible temporary increase in the difficulty of producing carbon black in the Panhandle due to decided changes in the volume and quality of gas supply it is safe to predict that "although the limitations in the Act will cut off certain gas wells now supplying carbon black plants there is an adequate supply of gas underground of the types which are permitted to be burned for black to assure a total rate of production for the industry well in excess of any probable present demand."

Among the powers given the Texas Railway Commission by the Gas Wastage Bill is the right to determine the reasonable market demand for gas for light and fuel purposes and to restrict the production of sweet gas to an amount equal to the market demand. It likewise instructs the Commission to prorate sour gas production, and further authorizes it to upset the prorated market, at least temporarily, when "unforeseen contingencies arise" which increase the demand for gas.

The Act also recognizes each gas and oil well as a separate entity and prescribes that its regulations shall apply to each well, and that an operator may not group the production of a number of wells, either for the purpose of simplicity or of averaging the effects of the law. It is the difficulties imposed on the operators, as well as on the Railway Commission, which must be straightened out before a clearer picture of the situation may be seen.

In any event it is the opinion of R. H. Eagles, Manager of the Pigment Division, J. M. Huber, Inc., that on the theory that the Act is not intended to increase unemployment by shutting down any existing industries "it is probable that means will eventually be found to avoid curtailment of current operations, and still carry out the intent of the Act."

There is another situation pending in Texas which may soon affect the carbon black industry. Although the Texas Legislature adjourned recently without taking any action on proposed legislation for taxing all natural gas as it comes out of the ground, and is not scheduled to meet again until 1937, rumor has it that in all probability a special session of the Legislature will be called within the next few months for the specific purpose of considering bills to raise revenue. Attorneys of the General Atlas Carbon Company are of the belief that if such a session is called carbon black will be one of the first items on which a tax will be levied. A tax affecting carbon black, plus limitations and regulations soon to be levied by the Texas Railway Commission, would undoubtedly cause a price rise for carbon black.

However, as the Binney & Smith Company points out, there is reason to hope that further legislative measure will not be drastic and carbon black stocks are now in a healthy position so that the industry would seem to be in a state of excellent balance. The only real threat at the present time is the possibility of new taxes on carbon black.

Incidentally, deliveries of carbon black for the month of May ran substantially ahead of the same month last year. One leading producer estimated that a check-up on final sales for the month would show a 10% increase to the tire trade, and a gain of about 80% to the paint and lacquer industry.

Open New Titanium Factory

The Titanium Pigment Company, with executive offices in New York City, has announced the opening of a new factory at Sayreville, New Jersey. The company's research laboratory, under the direction of J. L. Turner, has been moved from Brooklyn, New York, to the new factory which houses both a research and development department. 400 people are expected to be put to work at Sayreville.

SUPREME COURT UPHOLDS THE LAURSEN DECISION

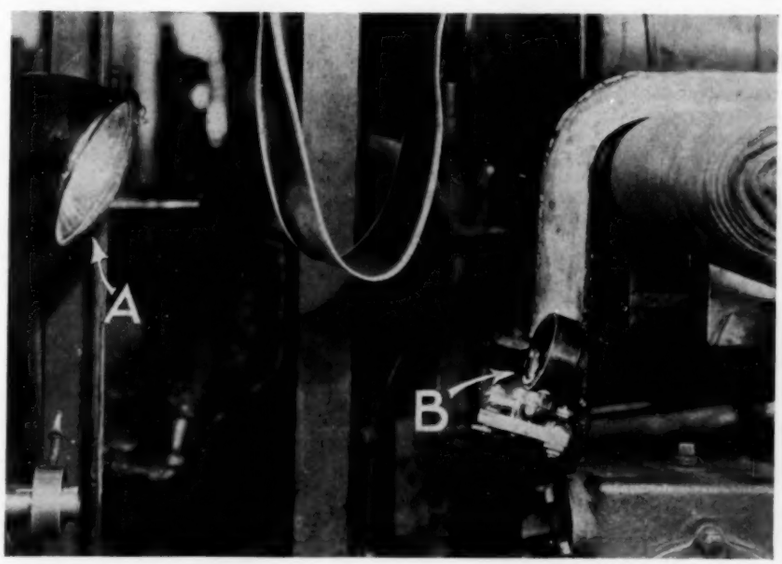
By decision of the Ohio Supreme Court, on May 29, Harry L. Lowe, of Eau Claire, Wisconsin, has been enjoined from starting action against L. A. Laursen, Akron inventor, in an effort to collect a share of the profits derived by the latter from the famous "water cure" process in the manufacture of tires and tubes.

Lowe, formerly a business representative for Laursen, has attempted to file suit against him for alleged royalties on patents which he allegedly sold for the inventor. The Supreme Court decision upheld the decision previously rendered by the Summit County Common Pleas and Appeals Courts, both of which had denied Lowe the right to file suit against Laursen on the grounds that the Federal courts had already decided in favor of the inventor.

Originally Lowe brought suit against Laursen in the Federal Court at Cleveland, alleging that he was a partner in the patent transactions, and was therefore entitled to 20% of all earnings of the royalties accruing from these patents, amounting to approximately $2,000,000. A Federal district court judge wrote an opinion favoring Lowe but died before a formal decree was entered. Later another district court judge affirmed the decree. On an appeal to the United States Circuit Court of Appeals, however, the decision was reversed in favor of Laursen.

Since that time Lowe has attempted to file suit in an effort to collect $399,500 from Laursen in various Ohio courts, resulting finally in the decision handed down by the Ohio Supreme Court which prevents him from starting any such action in the State.

"ELECTRIC EYE" RULES TENSION IN TIRE MANUFACTURE



A novel means of maintaining constant tension when separating impregnated tire cord from the canvas liner before the former goes to the tire building machine has recently been installed by a leading tire manufacturer, according to the Weston Electrical Instrument Corporation, Newark, New Jersey, who made the installation. The impregnated cord hangs in a loop, as seen in the illustration, the bottom of which hangs part way between a light source (A) and a Photronic Cell (B). If the loop becomes too long it interrupts the light beam and the speed of the winding drum is automatically adjusted to take up the slack. If the loop becomes too short, so that there is a direct pull on the canvas liner, the "electric eye" makes a similar automatic adjustment of the speed at which the tire cord is being drawn off.

Names in the News

HERMAN WESTLING, formerly associated with the Cambridge Rubber Company, and prior to that with the Lambertsville Rubber Company, has joined the Bearfoot Sole Co., Inc., of Boston and Akron, and will engage in development work.

L. A. MURPHY, purchasing division, Goodyear Tire & Rubber Company, was elected president of the Akron Purchasing Agents' Association on May 29. He succeeds CLARENCE D. BUCHER of the Mohawk Rubber Company. R. M. GRAHAM, General Tire & Rubber Company, was elected second vice-president.

WALTER H. DICKERSON, well known crude rubber merchant, is now associated with Munds, Winslow & Potter, New York City, rubber brokers.

E. H. BARDER, general superintendent, B. F. Goodrich Company, Akron, sailed from New York on May 29 for Germany and England, where he will study industrial operations.

L'ROCHE GEORGE BOUSQUET, formerly connected with the Titanium Pigment Company as a chemical engineer, has been named technical director of the American Zirconium Corporation, St. Helena, Maryland, a newcomer in the titanium pigment field.

EDWARD CASEY, general manager, Davidson Rubber Company, Charlton, Massachusetts, sailed last month for a vacation trip through Europe. He will also make commercial contacts.

R. H. MINER, Goodyear attorney, delivered the principal address at Decoration Day exercises held at Mt. Gilead, Ohio. He is a World War veteran and has been actively associated with American Legion affairs for many years.

CARL GEHRKE and H. ASSBROICHER, managing director and factory manager, respectively, of the Continental Rubber Company, Hanover, Germany, sailed for their homeland on May 29 after spending several weeks at the Goodrich factories in Akron.

U. L. HARMAN, who joined the Dryden Rubber Company, Chicago, early in 1935, has been made vice-president of that company. He has been associated with the rubber industry since 1921, starting as comptroller for the Mason Tire Company.

EDWARD ROSENDAHL, vice-president and general manager, Glyco Products Company, New York City, is sailing for a European business trip on June 19. He will sail on the Berengaria and contact Glyco's foreign representatives in Paris and London.

FRANK B. BROWN, Goodrich engineer, was elected first vice-president of the Akron Society of Professional Engineers on May 13. Elections took place during the annual meeting of the Society.

V. M. BREDIGER, vice-president and general manager of the Chardon Rubber Company, Chardon, Ohio, for the past five years was advanced to the presidency of that company last month at the annual meeting of the board of directors.

W. D. PARRISH, research chemist, B. F. Goodrich Company, Akron, was scheduled to sail from San Francisco on June 7 for the Malay Peninsula to aid in laboratory research on crude rubber being conducted at the source of supply by the company.

SCOTT A. EDGELL, of the Ohio Rubber Company, Willoughby, Ohio, was the winner of a contest conducted by the National Association of Cost Accountants on the "best paper of the year on accounting subjects." He was also elected to the directorship of the Association last month.

GEORGE E. PRICE, JR., assistant purchasing agent of Goodyear, led a discussion on "Buying for Scattered Plants" on May 21 during the 20th Annual International Convention of the National Association of Purchasing Agents held the week of May 20.

EDGAR M. RAUH has been appointed to the V-belt division of the Thermoid Rubber Company, Trenton, N. J., in a sales engineering capacity, including automotive fan belts and fractional horse power belts.

M. H. S. JONES, manager, field operating department, B. F. Goodrich Company, Akron, headed a list of 17 Goodrich employees eligible to receive 20-year service pins last month. The pins were to have been awarded on June 8.

WALTER L. HAIN, associated with the Goodyear Akron factories for several years, has been named personnel manager of the Goodyear California plant, and has already taken up his new duties on the West Coast.

JOSE P. MARCELO, chemist, has joined the Firestone Tire & Rubber Company, Akron. He graduated from the University of the Philippines in 1934 and intends to pursue a course in rubber technology at the University of Akron this Fall.

ALLAN SINCLAIR, works manager of the British Tyre & Rubber Company, Leyland, England, is visiting this country and was guest of honor at a luncheon held at the Yellow Tavern, Uniontown, Ohio, on May 16 at which E. H. BARDER, general superintendent, B. F. Goodrich Company, was host.

Jargstorff Joins Smith Chemical

George W. Jargstorff, whose resignation from C. K. Williams & Company was announced in our previous issue, has joined the Smith Chemical & Color Company, 55 John Street, Brooklyn, New York, manufacturers of dry colors, mineral fillers, and special chemical products. He will handle the sales of Smith colors and chemicals principally in the Eastern territory, and may be reached at the company's Brooklyn offices. Prior to his association with C. K. Williams Mr. Jargstorff was with Plastics Industries, Inc., of Newark, N. J., where he engaged in the research and production of resins and molded plastics. He was also associated with the General Research Laboratories of the U. S. Rubber Company, at Passaic, for a period of eight years, in development work. His experience covers the use and development of accelerators, anti-oxidants, reinforcing and inert fillers, coloring agents, plasticizers and general rubber and plastic compounding ingredients.

Form Kelsan Products Company

Kelsan Products has been formed at St. Clair, Michigan, to develop the Kelsanite process, which makes possible the use of rubber protective coatings applied in liquid form, described in our previous issue. The company was organized by P. E. Kelley, who has been identified with the rubber industry for some 30 years, and Frank M. Sanders, one-time assistant general manager of the British Dunlop Rubber Company. The technical perfection of the process was carried out under the supervision of Mr. Kelley. It is understood that several industrial concerns are carrying out extensive experiments with Kelsanite.

Reorganizing American Zinc

Stockholders of the American Zinc, Lead and Smelting Company will vote on a recapitalization program on June 27 in Portland, Maine. The plan calls for the exchange of 6% preferred stock, of which approximately 75,000 shares are outstanding, into a 5% non-cumulative issue at one share of new preferred and six shares of common stock for each preferred share now outstanding. The old preferred stock has accumulated dividends of $76.50 per share.

Set Chemical Exposition Date

The 15th Exposition of Chemical Industries will be held at Grand Central Palace, New York City, the week of December 2 to 7 inclusive. The registered attendance at this exposition has been more than tripled in the last ten years. At the last exposition, held in 1933, the attendance was 34,269.

HERBERT J. WINN, president, Taylor Instrument Companies, Rochester, New York, sailed for Europe and the Continent on May 15 on the Aquitania. He is expected to return to this country early in July.

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Financial News

MONSANTO CHEMICAL CO. HAS INCREASED PROFIT

Net operating profit for the Monsanto Chemical Company, St. Louis, Missouri, for the quarter ended March 31, 1935, amounted to $757,195 which, after deducting subsidiary preferred dividend requirements, is equal to 85 cents a share on 864-000 outstanding shares. In the same period of 1934 the company reported net profit of $674,117, or 78 cents a share on the same number of outstanding shares.

At a meeting held in Birmingham, Alabama, on April 29, stockholders of the Swann Corporation approved plans for a merger with Monsanto. At a special meeting of Monsanto stockholders on May 3 the latter also voted approval of the merger. The merger was consummated on the basis of 1 share of Monsanto stock for each 4½ shares of Swann stock. The Swann Corporation, and its subsidiaries, are principally engaged in the electrochemical production of phosphoric acid and its derivatives.

Adding Monsanto's proportion of earnings of controlled subsidiary companies, and including earnings of the Swann Corporation, total net profit for the quarter was $925,324 equal to 96 cents a share on 959,554 shares which will be outstanding when the exchange of stock involved in the recently-completed merger is completed.

HOOD RUBBER EARNINGS DROP SHARPLY FROM 1934

Earnings of the Hood Rubber Company, Watertown, Massachusetts, for the eight months of the company's current fiscal year which started September 1, 1934, were reported as being $2,674. This compares with a profit of $337,259 for the corresponding period in the previous year.

During the first four months of 1935 Hood registered a loss of $184,869 against a profit of $5,417 during the first four months of 1934. As causes for the drastic drop in earnings the report made mention of a seasonal let-down in general business conditions, in addition to a trade price war on canvas shoes.

UNITED CARBON SALES SET QUARTERLY RECORD

United Carbon Company, Charleston, West Virginia, and subsidiaries, report a net profit of $477,633 for the quarter ended March 31, 1935, after depreciation, depletion and Federal taxes were deducted. This profit is equal to $1.21 a share on 394,327 no-par shares of capital stock.

Results for the first quarter of this year constituted a new high record for any quarter reported by United Carbon, exceeding the previous high established in the fourth quarter of 1934 when net earnings equaled $1.18 per share. The net profit for the period ended March 31, 1935 compares with a profit of $309,863 reported for the similar 1934 quarter which was equal to 76 cents a share on 370,127 shares of common stock.

Current assets on March 31, 1935, amounted to $2,441,900, including $674,666 in cash. Current liabilities were shown at $758,208. Long term notes payable were reported at $800,000, a substantial reduction from total note indebtedness of $1,350,000 shown on January 2, 1935, represented by $500,000 outstanding at the end of 1934 plus $850,000 issued on January 2, 1935, pursuant to the acquisition of the carbon black and gas properties of the Century Carbon Company as of the same date.

United Shoe Machinery Profit

For the year ending February 28, 1935, the United Shoe Machinery Corporation, Boston, Massachusetts, reports net income of $8,825,514, apart from $2,700,000 in dividends received from certain associated companies, equal to $3.65 per share of common stock based on the average number of shares outstanding during the year. The reported profit does not include $466,-759 deducted for the payment of preferred dividends. In the previous fiscal year United Shoe Machinery reported net income of $9,458,016, or $3.92 per share.

New Jersey Zinc Has Profit

For the quarter ended March 31, 1934, the New Jersey Zinc Company, New York City, reports net earnings of $1,060,889, after deducting taxes, depreciation, contingencies, and other charges, equal to 54 cents a share on 1,963,264 shares of $25.00 par value. In the same quarter of 1934 profit of $1,092,207, which included $75,254 proceeds from patents, was reported, which was equal to 55 cents per share.

Lee Reports 6-Month Profit

For the six months ending April 30, 1935, the Lee Rubber & Tire Corporation, Conshohocken, Pennsylvania, reports a net income of $112,970, after deducting taxes, depreciation and other charges. Net sales for the period, after all deductions and allowances, amounted to $3,705,493. Net income before depreciation totalled $208,677. Surplus as of April 30, 1935, was shown at $1,157,578.

Loss for Mohawk Rubber

Mohawk Rubber Company, Akron, Ohio, and subsidiaries, report a net loss of $172,-248, after taxes and interest, for the year of 1934. This compares with a net loss of $181,142 reported for 1933.

CANADIAN GOODYEAR TO REORGANIZE ITS SET-UP

The capital structure of the Goodyear Tire & Rubber Company of Canada, Ltd., is going through a process of reorganization voted by the board of directors. It was announced on May 17 that all outstanding preferred shares, amounting to $7,345,800, will be redeemed by Canadian Goodyear on June 17, the company offering $110.00 (Canadian funds) per share, plus accrued unpaid dividends.

35,502 preferred shares will be cancelled, leaving authorized, unissued preferred shares of an aggregate par value of $8,000,000, which will be split into shares of $50.00 par value. Common shares, of which there are 128,630 outstanding, will be split two for one. The dividend rate on the latter shares will be lowered from 7 to 5%.

A new issue of $6,000,000 of preferred stock is now being offered by a group of investment dealers. Present preferred stockholders will be permitted to subscribe for not more than 60,000 shares, and 60,000 shares underwritten and offered to the general public. The new issue is priced at $49.50 per $50.00 par value share, yielding 5.05 per cent. Preferred share dividends on the new offering will accrue from July 1, 1935.

Columbian Nets Quarterly Profit

For the quarter ended March 31, 1935, the Columbian Carbon Company, New York, reports net earnings amounting to $787,458 after depreciation, taxes, minority interest, and other charges. This is the largest profit earned for any corresponding period since 1930. The quarterly profit was equal to $1.46 a share on 537,719 no-par shares of common stock. A net profit of $558,000 was reported in the quarter ended March 31, 1934.

Raybestos-Manhattan Dividend

Announcing a net profit of $310,633 for the quarter ended March 31, 1935, directors of Raybestos-Manhattan, Inc., Passaic, N. J., declared a dividend of 25 cents per share payable June 15 to stockholders of record on May 31, 1935. The quarterly profit was equal to 48 cents per share, and was comparable to a net profit of $292,973, or 46 cents a share, reported for the same period of 1934. Net current assets represented $11.00 per share, of which cash and marketable securities amounted to $3.92 per share.

General Tire Listing Stock

General Tire & Rubber Company, Akron, has applied to the Cleveland (Ohio) Stock Exchange to list 10,000 additional shares of common stock which will bring up the authorized common stock to 100,000 shares. At present there are 86,320 outstanding shares. General also is listing 35,000 shares of preferred stock. The company is filing application with the Securities Exchange Commission for permanent registration.

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NEW ENGLAND NEWS

New England rubber manufacturers and suppliers of equipment to the industry appear to be maintaining code wage and hour standards in spite of the downfall of NRA. While competitive conditions may in the future force adjustments in some plants, indications early in June were that no immediate changes were contemplated.

Aside from the natural desire of manufacturers not to "rock the boat" at this critical juncture, the militant attitude of labor in New England centers would make any drastic downward adjustments productive of trouble. With many plants operating at production levels higher than those of several years past, the danger of labor unrest is not to be considered lightly, as one executive pointed out.

A check of six plants in Bridgeport, Conn., which are typical of New England rubber and equipment manufacturing, disclosed no evidence of intention to take advantage of the situation. While some executives were reluctant to discuss the matter at length, all concurred in the stand that present wage and hour levels should be left undisturbed for the present.

An executive of The H. O. Canfield Company told THE RUBBER AGE that the company would adhere to code labor provisions for the present and that the possibility of changes had not been discussed. The company has been operating successfully, with a large production volume, for a number of months, making plumbers' supplies and rubber specialties.

No changes are planned now at the plant of the Housatonic Tool & Machine Company, according to J. W. Weir, president. The company makes rubber tubing, insulating and straining machines. Mr. Weir said he did not care to amplify his statement in view of future uncertainties.

Jenkins Bros. Company has made no changes in wages or hours and does not contemplate any, an officer stated. The company's rubber division has been very busy since last November, producing fruit jar rings, friction and rubber tapes and other items. Some overtime has been necessary lately to meet orders.

The General Electric Company, which operates a large rubber department at the Bridgeport plant as part of the construction materials division, manufacturing rubber insulated wire and plugs, is not expected to alter its labor policy as a result of the NRA collapse. The company's relations with its labor have been maintained on a thoroughly amicable basis for a number of years.

C. F. Holcomb, president and general manager of The Canfield Rubber Company, said no changes were planned for the immediate future and that the company would make every effort to keep working arrangements on a basis satisfactory to its employes.

Because of the absence of G. L. Hammond on a Western business trip, no statement could be obtained as to the plans of the Black Rock Mfg. Company, maker of rubber cutting machines.

From this body of executive opinion in a typical rubber manufacturing center, the trend of ideas on the subject can readily be seen. Lack of time precluded a check of other New England cities, and in many cases officers and directors of larger companies, particularly those operating under absentee ownership, had had no opportunity to discuss policies.

Raymond E. Hegel, widely known in Connecticut rubber manufacturing circles through his former connection as sales promotion and advertising manager of the J. C. Haartz Company, New Haven, now the Duro-Gloss Rubber Company, has resigned as associate secretary of the New Haven Chamber of Commerce to become executive vice-president of the Manchester, Conn., Chamber.

Final certificates of dissolution have been filed with the Connecticut Secretary of State at Hartford for the corporations of the Naugatuck Chemical Company and Goodyear's India Rubber Glove Manufacturing Company, both of Naugatuck. Both companies are subsidiaries of the United States Rubber Company, now operating at Naugatuck as U. S. Rubber Products, Inc., and the dissolution move completes a rearrangement of corporate set-up.

A large number of employes of the waterproof mills of U. S. Rubber Products, Inc., Naugatuck, Conn., were feted at a "quality banquet" held in May in the plant recreation room. J. D. Wilmot and R. J. Ford were among mill officials on the speaking program.

May Purchase Goodrich Hose

If the B. F. Goodrich Company, Akron, extends its guarantee on its fire hose from three to five years, the City of New York will purchase 62,500 feet, it was announced on April 22. The hose was rejected originally because its organic acetone content exceeded the small percentage permitted by the New York specifications. According to New York Fire Commissioner McElligott, this factor shortens the life of the hose. Negotiations are now being conducted between Goodrich and New York officials. Bids on fire hose requirements for New York City, opened April 16, from ten different rubber companies all proved to have the same price quoted per foot.

9,300 Cases of Rubber Burn

A fire which totally destroyed a five story brick warehouse, owned by the New York Dock Company, on the Brooklyn (N.Y.) East River waterfront, was responsible for the destruction of 9,300 cases of crude rubber, among other valuables. The fire, gaining headway rapidly, raged for two days before finally being brought under complete control. Dozens of firemen were overcome by the acrid smoke caused by the burning rubber and rolls of waterproof paper. The crude rubber stock had been stored in the warehouse for about two years and was under consignment to the New York Commodity Exchange. The origin of the fire has not yet been determined.

Receiver for Canadian Rubber

The Premier Trust Company, Montreal, has been appointed receiver and manager of the Canadian Mechanical Rubber Corporation, Ltd., of Orillia, Ontario, by order of Justice A. C. Kingstone, Toronto, Canada. The Premier concern applied for an order as successor to the Imperial Trust Company in the position of trustee under a mortgage dated December 1, 1933, obtaining an issue of $275,000 of redeemable sinking fund gold bonds of the rubber company. Of this issue bonds to the value of $184,200 were stated to be outstanding at present.

May Increase Canadian Duty

Rubber manufacturers in Canada have petitioned the Tariff Board for added protection in the way of increased duties against importation of hard rubber combs from Germany and partly-finished hard rubber products from the United States. Joseph Stokes Rubber Co., Ltd., of Welland, Ontario, a subsidiary of the New Jersey rubber manufacturer, also asked the Board for increased protection on hard-rubber tubes for fountain pen manufacturers and a new duty on hard rubber sheets from the United States. The Board is expected to accede to the various requests.

Mansfield Tires in Exposition

The process of manufacturing tires, as practiced in the factory of the Mansfield Tire & Rubber Company, Mansfield, Ohio, is depicted by a display sponsored by the company at the Greater Mansfield Exposition of Progress. Cut-away section of tires are on view to better acquaint the laymen with tire construction.

Will Handle Sales Direct

The sales staff of the John Waldron Corporation, New Brunswick, New Jersey, as reported in our previous issue, will handle the sales of the Francke Flexible Couplings and Silent Steel Gears direct, as of July 15. Heretofore the sales of these products were handled through the firm of Smith and Serrell, of Newark, New Jersey, who functioned as general sales agents.

TRENTON NEWS

Whitehead Brothers Rubber Company, Trenton, is building an extension to its plant at a cost of $10,000. The building, of brick and steel, will be two stories in height.

Atlantic Footwear Company, 834 Main Avenue, Passaic, N. J., has been chartered at Trenton, with $25,000 capital stock to manufacture rubber footwear. The incorporators are Irving Rosenburg, 1114 Stratford Avenue, New York City, and Elias and Mollie Masslaskey, both of 361 Madison Street, Passaic.

Awards totaling $83,500 have been made by the Court of Chancery to receivers and counsel of the Kelly-Springfield Tire Company for their services in receivership proceedings. The sums granted are: Receivers Edmund S. Burke and Daniel O'Regan, $13,500 each; Frank C. Ferguson, $10,000; John P. Maguire, $3,500; Merritt Lane, general counsel, $20,000; Stanley Clarke, $7,500; John Tozer, $6,000; William Harris, $5,000; Scott McLanahan, $2,000, and Walter Stern, counsel for the noteholders' protective committee, $2,500.

J. Edward Myers, superintendent of the Hamilton Rubber Mfg. Company, Trenton, was recently elected one of the nine councilmen of the new governing body of Trenton. The council takes the place of a city commission which ruled for 24 years.

Nearpara Rubber Company, Trenton, which recently suffered a severe loss by fire, has rebuilt a portion of its main plant and is now operating 20 hours a day.

A.S.T.M. ANNUAL MEETING TO BE HELD JUNE 24 to 28

The 38th Annual Meeting of the American Society for Testing Materials, Philadelphia, will be held at the Book-Cadillac Hotel, in Detroit, Michigan, from June 24 to 28, inclusive. Sixteen sessions, in all, are scheduled. On Tuesday evening, June 25, a symposium devoted to the place of materials in automobile rides and roads will be held during which K. D. Smith, technical superintendent, tire division, B. F. Goodrich Company, will discuss "The Tires." A session devoted to rubber products and petroleum will be held on Wednesday afternoon, June 26. The annual A.S.T.M. dinner will be held on Wednesday evening.

During the rubber and petroleum session Committee D-11 on Rubber Products, of which Harlan A. Depew, of the American Zinc Sales Company, is chairman, will render its report, including the progress achieved in the development of methods of test for flex cracking of vulcanized rubber (three recognized procedures), flexing life of rubber-fabric combinations, accelerated aging of vulcanized rubber (Geer oven and Bierer bomb), effect on vulcanized rubber at elevated temperature and pressure (air bomb) and compression set of vulcanized rubber under constant deflection. A new project to provide rubber test samples having standard properties for use as reference standards will be discussed.

The Committee will also recommend revision for immediate adoption in the standard specifications for cotton rubber-lined fire hose for public and private fire department use; submit proposed revisions in the standard methods of physical testing of rubber products and in the tentative specifications for insulated wire and cable: performance rubber compound, and class AO, 30 per cent Hevea rubber compound. Revisions in specifications and tests for rubber insulating tape and for friction tape for general use for electrical purposes will also be recommended by the Committee during the session.

In addition to the various technical sessions an exhibition of testing apparatus and related equipment will be held during the week. Among firms represented at the exhibition will be the Baldwin-Southwark Corporation, Shore Instrument & Manufacturing Company, Testing Machines, Inc., and the C. J. Tagliabue Manufacturing Company.

GOODYEAR-SEIBERLING SETTLEMENT PENDING

Attorney L. M. Buckingham, representing the Goodyear Tire & Rubber Company, revealed that amicable arrangements for an early settlement of the Goodyear vs. F. A. Seiberling suits are being worked out by counsel for both sides, when he requested continuation of three eight-year old lawsuits in a petition filed on May 15 in the Akron Common Pleas Court. The settlement is being arranged as the result of a special master's hearing by Owen D. Young, noted industrialist, now chairman of the board of General Electric.

The suits were an outgrowth of the Goodyear financial difficulties which occurred in 1920, resulting in the removal of Francis A. Seiberling as president. Two of these suits were filed against Mr. Seiberling in January, 1927, alleging fraudulent misappropriation of company funds. The defendant contended that during Goodyear's struggle to exist he was forced by banks to endorse and support its paper with his own resources, the total of notes so endorsed by him over a period of years running to almost a half-billion dollars.

In all, Goodyear sought to recover $4,435,407 from Mr. Seiberling, plus interest, which if allowed would have run the requested sum to more than $5,000,000. Mr. Young's report as master in the hearings stated that Seiberling owed Goodyear approximately $3,000,000. It is not known what sum is being discussed by the attorneys for complete settlement of the three suits involved.

RUBBER WORKERS PROPOSE INTERNATIONAL UNION

A move is underway to band all organized rubber workers together into an international union affiliated with the American Federation of Labor. To date the Goodyear, Goodrich, Firestone, and General locals have all passed favorably upon the formation of such an organization, several of them having already submitted their ideas to William Green, president of the A. F. of L., at Washington.

At present all locals are chartered directly by the American Federation of Labor as federal unions. They are affiliated with one another, and with several craft internationals having members working in the rubber industry, through the United Rubberworkers' Council, of which Coleman C. Claherty, labor organizer, is president.

Sponsors of an international rubber union are preparing to fight to make it an industrial, or vertical, set-up which would include in its scope all employes of the rubber industry irrespective of their craft or occupation. Consideration is being given to calling a general convention to discuss plans at which all unions affiliated with the United Rubberworkers' Council would convene.

Set Fall Meeting Date

The Fall meeting of the New York Rubber Group will be held on October 11 at the Building Trades Employers' Association club rooms, at 2 Park Avenue, in New York City. The Society of Rheology, which includes several members of the New York Rubber Group in its membership, will meet jointly with the rubber group at this meeting. Plans for an interesting program are being made and will soon be announced.

Rubber Division to Convene

The Rubber Division, A.C.S., will convene at Akron on September 30 and October 1. The Executive Committee decided upon these dates recently rather than to hold the Fall meeting in San Francisco the week of August 19 in conjunction with the meeting of the American Chemical Society. The Hotel Mayflower will serve as headquarters during the two-day session at Akron.

Urges Rubber Bearings

According to the thesis of F. W. Rouatt, student of the College of Engineering, University of Saskatchewan, in Canada, a rubber bearing lubricated with water may last 10 times as long as a babbit bearing lubricated with oil, and the friction is extremely low. While Mr. Rouatt's thesis is devoted largely to calculations of the resistance of rubber to forces, he urges a more complete study of rubber bearings.

BOSTON RUBBER GROUP HOLDS SPRING MEETING

The Spring meeting of the Boston Rubber Group was held on Friday night, May 17, at the University Club in Boston. The usual dinner preceded the meeting.

Peter P. Pinto, general manager of THE RUBBER AGE, was the first of two speakers on the program. He delivered an interesting lecture on "Strange Patents," based on material collected by Carl J. Wright, vice-president of the General Atlas Carbon Company. The lecture was illustrated by amusing slides which showed the many strange patents found in the U. S. Patent Office.

The second speaker was Charles E. Maynard, factory manager, Fisk Rubber Corporation, who discussed "Machine and Process Development." Punctuating his address with many actual examples of such development in the Fisk factories, Mr. Maynard devoted his talk to the type of individual responsible for it. He outlined the necesary qualifications needed for development work including individual inventive ability, general scientific knowledge, and personal determination to secure results. *(Complete paper, this issue, Page 131.)*

The necessity of development work to protect plant investment was also discussed by Mr. Maynard who, in concluding his address, vigorously defended labor saving machinery from the attacks of economists, quoting figures to prove machinery of this type in the long run has put more people to work than it has displaced.

CHICAGO RUBBER GROUP HOLDS SPRING MEETING

The Chicago Rubber Group held its annual Spring meeting on Friday evening, May 10, in the College Inn and the Crystal Room of the Hotel Sherman, in Chicago. The attendance at this meeting was the largest of the Chicago group since 1928, according to Secretary Lewis.

The first of two speakers, Dr. H. A. Winkelman, of the Marbo Corporation, gave an illustrated talk on "A New Method for Compression Tests." During his discussion Dr. Winkelman offered data showing the compression tests on all the pigments commonly used in the rubber industry.

Following this address Mr. J. C. Nichols, noted hunter, delivered a short talk on "Alaska," at the conclusion of which he introduced Dr. Frederick Cook, famous explorer, who continued the discussion on the Far North and spoke of his trip to the North Pole in 1909.

The meeting concluded with the distribution of the usual door prizes. Mr. S. Collier, chief chemist of the Waukegan (Ill.) factory of the Johns-Manville Corporation, was chairman of the meeting and arranged the interesting program described.

Report on Guayule Production

As a result of guayule shrub harvesting during 1934 by farmers in the vicinity of Salinas, California, the Intercontinental Rubber Company, New York, reports that the American Rubber Producers, Inc., a subsidiary, produced 1,254,600 pounds of dry Calpar guayule rubber in its extraction plant at Salinas. According to the report all of this production was sold to domestic rubber manufacturers with the exception of 56,000 pounds shipped to Canada.

LOS ANGELES NEWS

Charles N. Merralls, president of the California Rubber Manufacturers' Association, Los Angeles, after a brief survey of conditions, reports no indications among California rubber goods manufacturers to cut wages or lengthen hours because of the Supreme Court decision nullifying the code powers of the National Recovery Administration. "In our own factory, Rubbercraft Corporation of California, Ltd., girls have not worked more than 8 hours per day in the last twelve years," says Mr. Merralls, "and to my definite knowledge the code provisions as to hours and wages were scarcely needed, if at all, among manufacturers on this coast.

"We found that NRA interfered with the training of new girls. In the old days we paid a minimum of ten dollars per week for girls while they were learning some specific duty. We feel that was generous pay during the first six months when they were comparatively non-productive. The wage provisions of NRA raised the inexperienced girl's pay beyond her value. As to the others, those with experience, we and most of my competitors, always have paid well above the NRA minimum.

"The rubber manufacturers of California see a bright future. We feel that now we can move forward unrestricted and we have no intention of underpaying or overworking anyone. Our own factory here is turning out from 17 to 22 per cent more dollar volume in merchandise than it did during the corresponding months of 1934. For several weeks we have been running 24 hours per day. We have added new products to our line and even now have several patents pending.

"I might say that most of the rubber manufacturers are convinced that the increased demand for rubber goods this year over last year is due to replacement demand, a demand that can no longer be held back, more than to distribution of government funds. We feel this because most of us are right now replacing many things already used too long. Our factory has replaced over-used trucks, automobiles, factory equipment including presses, and other items. There are many other things we shall buy during the next few months. If replacement with us is now imperative replacement by our customers is likewise now imperative."

The M. and D. Display Manufacturing Corporation, 717 Mateo Street, has placed on the market a new type of juvenile skate. The new article is equipped with demountable rubber tires which can be replaced as needed. Other improvements are the new automatic steering device and the new clamp which does away with the need of a key.

A new type of pneumatic stool cover for bath shower stools has been perfected and placed in retail channels by the Rubbercraft Corporation of California, Ltd. The increasing use of a stool in a bath shower stall has created a good market for the product.

W. B. Heckman, Pacific Coast sales manager for the general products division of the United States Rubber Products, Inc., reports that the sales volume in rubber bathing suits shows an incerase of approximately 300 per cent over the corresponding months of last year. This improved condition prevails up and down the entire Pacific Coast, he states. Turquoise blue is reported as the most popular color, but combinations are also in demand. Shell pink is also showing strength in all coast retail markets.

These garments, have been popularized this spring by display efforts. A four-day display event at the St. Francis Hotel at San Francisco was followed by similar two-day events at Fresno, Sacramento, Stockton and other California cities. Medium priced garments are leading in volume, that is numbers retailing at $2.95 and $3.95, although numbers priced up to $5.00 are selling in good volume.

Two-color two-piece suits are popular because of the combinations afforded by them, Mr. Heckmann states. New perforated models are proving very popular because of the increased fabric feel and coolness. Among popular numbers in rubber footwear Mr. Heckmann mentions the new peasant sandals, each in two colors, the body of the uppers being in white, linen, blue or brown and the tongues in more brilliant colors, notably red. The soles are in natural color crepe rubber. The demand for these has exceeded expectations, Mr. Heckmann states.

GOODRICH PLANS ISSUE OF $30,000,000 BONDS

The B. F. Goodrich Company, Akron, has called a meeting of stockholders for July 16 to approve plans for issuing $30,000,000 new refunding bonds to refund its outstanding First Mortgage 6½% Gold Bonds, due in 1947. According to the company the new issue will consist of First Mortgage 4½% twenty-five year Bonds.

The purpose of the new financing move is to save approximately $357,830 in annual interest charges. The now outstanding first mortgage bonds amount to about $17,800,000. The new plan proposes that the maximum of bonds which may be outstanding at any one time under the mortgage be fixed at $45,000,000 in order to provide for business increases and for other company needs. No bond issued under the proposed new mortgage will have a maturity date later than December 31, 1935.

To Hold Research Conference

The Chemistry Department of Johns Hopkins University, Baltimore, has set June 24 to July 12 as the dates for its Fifth Research Conference to be held at Gibson Island, near Baltimore. These conferences are intended to combine business with recreation, each day beginning with a more or less formal lecture later subjected to open discussion. Present plans call for a discussion of "Synthetic Rubber, Duprene and Thiokol" by W. H. Carothers and J. C. Patrick, of DuPont and Thiokol respectively, on July 2; "Determination of Molecular Weights of Big Molecules" by E. O. Kraemer, of DuPont, on July 3; and "Rubber" by Thomas L. Midgley, Jr., vice-president, Ethyl Gasoline Corporation, on July 5. Mr. Midgley will also preside over the discussions held the week of July 1.

Change Columbia Brand Name

Effective immediately the material sold by the Columbia Alkali Corporation, of Barberton, Ohio, under the name "Columbia Brand Whiting" will be known as "Columbia Filler." The quality and properties of the material remain unchanged.

OBITUARIES

Robert Hursh

Robert Hursh, sales manager of the Pigment Division of the New Jersey Zinc Company, New York City, died suddenly on May 13. Death was due to a cerebral hemorrhage. Mr. Hursh was born in Cambridge, Massachusetts in 1885, graduated from the Massachusetts Institute of Technology in 1906, and joined the New Jersey Zinc Company in 1907. His duties with the company included engineer-in-charge at Mexico, assistant manager of the Colorado section, Pacific coast district sales manager, and sales manager of the Pigment Division. He was a member of many social and business clubs, having been an ardent golfer and fisherman. Interment was made at Mt. Auburn Cemetery, Cambridge, Mass. He is survived by his widow, one sister and two brothers.

Edwin H. Grafton

Edwin H. Grafton, well known rubber chemist, died May 11 at his home, 1515 Lawrenceville Road, Trenton. Death was due to a heart attack. He was born in Carlisle, England, 67 years ago, went to sea when a youth and became an electrician on a cable-laying boat. Later he came to the United States and joined the insulated wire department of the John A. Roebling's Sons Company. He was later made president of Whitehead Brothers Rubber Company, Trenton. For several years he was a rubber chemist for the Vulcanized Rubber Co., Morrisville, Pa., and retired about four years ago. He is survived by a daughter and two sons. Burial was in Trenton.

Thomas Hunt, Sr.

Thomas Hunt, Sr., former superintendent of the Hamilton Rubber Mfg. Company, Trenton, died on May 11 in a Trenton hospital. He was 75 years old. He was born in Boston and went to Trenton when a boy. He was at one time employed by the Pennsylvania Railroad Company and retired about 12 years ago. Mr. Hunt was a widower and is survived by two sons. Burial was in Trenton.

Andre Dubosc

Word reached us recently of the death of André Dubosc, famous French research chemist and rubber technologist, who died on March 22 at Rouen, France, at the age of 76. The author of many technical papers, M. Dubosc edited *Le Caoutchouc et la Gutta Percha* from 1914 to 1920. In addition to his commercial activity he was well known in the fields of art and music. In 1926 M. Dubosc wrote a series of articles on "Vulcanization and Accelerators" which appeared in THE RUBBER AGE.

A. L. Poppe

A. L. Poppe, partner of the Poppe Rubber & Tyre Company, Twickenham, Middlesex, England, died on May 24 after a long illness. Since the inception of the company he was active in its management, retiring only when forced to by poor health several months ago which ended in his death.

CARBON BLACK RESEARCH LEADS TO NEW PATENTS

Research conducted since 1927 by the Carbon Black Fellowship, sustained by the Columbian Carbon Company, an affiliate of the Binney & Smith Company, New York, at Mellon Institute, Pittsburgh, of which C. W. Sweitzer is the incumbent, has led to the development of a method of colloidally dispersing carbon black pigments in lacquer vehicles, this dispersion resulting in improved properties for black lacquer. As a further result a process for making a dry lacquer intermediate was patented, the product now being manufactured by the Binney & Smith Company under the name of "Coblac."

The use of Coblac is said to enable manufacturers to prepare superior black lacquers by dissolving it and formulating a solution with stock solutions to give the desired product. It also eliminates the pebble mill grinding of carbon blacks since the carbon black is dispersed in Coblac and retains this colloidal dispersion during subsequent solution and formulation.

Darkened concrete, preferred by many states in new highway construction, is obtained by coloring with black pigments, carbon black having been found satisfactory for this purpose. Studies conducted by the Carbon Black Fellowship showed that maximum darkening of concrete could be obtained with minimum pigment content (2% carbon black) by the use of aqueous dispersions of the black. Physical tests on concrete containing 2% dispersed black also showed increased strength. Aqueous dispersions of carbon black for use in darkening concrete are now being manufactured and sold under the name of "Hiblac."

Battle Patent Pool Monopolies

With the stated intention and purpose of fighting the abuses of patent pool monopolies, the American Economic Foundation, with offices at 20 Exchange Place, New York City, has been formed. The new organization proposes to oppose abuses, protest higher prices, support consumers' interests, eliminate expensive lawsuits, and encourage progress. Percival White is director of the Foundation.

India Plantations Decrease

The number of rubber plantations in India in 1934 amounted to 4637, covering an area of 253,427 acres. This is a slight decline as compared with the number in operation in the previous year. Total rubber production for the country in 1934 was 12,915,000 pounds.

Norwalk Tire Increases Loss

Norwalk Tire & Rubber Company, Norwalk, Connecticut, reports a net loss of $5,323 for the six months ending March 31, 1935, as compared with a $2,886 net loss reported in the corresponding period last year. Total income for the period amounted to $54,766 prior to deducting charges.

Negotiate for Goodyear Plant

It is understood that negotiations are under way between the Chinese government and Goodyear officials for the construction of a tire factory in China. No confirmation of this report has been made, Goodyear officials at Akron pointing out that the soon completed factory in Java is expected to supply the Orient.

Nuemann Named Manager

R. M. Neumann

R. M. Neumann has been appointed Manager of the Pigment Division of the New Jersey Zinc Sales Company succeeding the late Robert Hursh. He has been associated with the company since 1906, starting as a clerk in the treasury department. In 1918 he was named western sales manager, with headquarters in Chicago. In his new post Mr. Neumann will be located at the New York headquarters.

Increase Siam's Rubber Quota

After considerable negotiating between officials of Siam and representatives of the International Rubber Regulating Committee the rubber quota for that country was raised from 15,000 to 40,000 tons, effective as of July 1. Siam's quota will remain at the 40,000 ton figure for the length of the agreement, while exportable percentages will be not less than 75% for 1935, 85% for 1936, 90% for 1937, and 100% for 1938, the last year of the agreement. Siam is also permitted to plant 31,000 acres prior to 1938. Its present planted rubber area is about 150,000 acres, most of which is in small native holdings.

I.T.S. Expands Campaign

The I.T.S. Company, of Elyria, Ohio, manufacturers of I.T.S. Left-and-Right Level Wear rubber heels, has expanded its radio broadcast program to include 26 stations from coast to coast. All company announcements are preceded with a rhythmic "left, right, left, right" staccato. Two to six announcements are made at present on each of the 26 stations employed. According to the announcements I.T.S. rubber heels have extra pads of tough rubber where shoe wear is heavy, viz: on the outer left side of the left heel and the outer right side of the right heel.

Incorporate Witco, Ltd.

Witco, Ltd. has been incorporated in England as an associate of Wishnick-Tumpeer, Inc., of New York City. Sales offices of the English company are located in Bush House, London. T. F. Dunn is managing director, and C. C. Hallett is secretary and sales manager. In addition to carbon black Witco, Ltd. is handling a complete line of chemicals, colors and pigments for the paint, ink and rubber industries.

RUBBER EXPORT TRADE SHOWS BIG INCREASE

United States exports of rubber products during the first three months of 1935 were valued at $5,723,139, an increase of 15, 63 and 21% over the corresponding periods in 1934, 1933 and 1932, respectively, according to a report from the Department of Commerce at Washington.

Only one general class of rubber manufacturers suffered a trade loss from the 1934 period, and this was slight—namely, rubber sundries and specialties, to $319,180 from $319,460. Gains were registered in all other classes of products, as follows:

Tires, tubes, and tire-repair materials, from $2,791,980 to $3,099,438, 11 per cent; rubber footwear, soles, and heels, from $160,761 to $217,188, 35 per cent; mechanical rubber goods (belting, hose, packing, gaskets), $702,584 to $768,368, 9 per cent; rubberized fabrics and hospital sheeting $165,245 to $167,358, 1 per cent; hard rubber goods, $71,807 to $86,264, 20 per cent; semi-manufactured rubber goods, including reclaimed rubber, scrap rubber, and rubber thread, $507,774 to $591,694, 17 per cent; all other rubber products, $275,151 to $473,649, 72 per cent.

Canada Increases Export Trade

An increase of approximately $3,500,000 in the rubber export trade in the last fiscal year is reported by the Canadian Dominion Bureau of Statistics. The principal items of export were pneumatic tires and boots and shoes. During the fiscal year ended March 31, 1935, the value of rubber exports from Canada was $12,425,000, compared with $8,969,000 in the previous fiscal year. Exports of tires, valued at $658,000, compared with $599,000 in the previous period, went to seventy-nine countries. The Bureau also reported an increase in Canadian imports of raw rubber from British sources. Imports of rubber last March totaled 6,071,000 pounds, of which more than four million came from the United States and 1,298,000 from the Straits Settlement. In 1934 the supply from the latter source rose from 182,000 to 8,242,000 pounds.

Importer Seeks Quotations

Under date of April 26 Mr. S. P. Ling, manager of the South China Consolidated General Rubber Trading Company, 14, Sakee Sai Hou Kai, Canton, China, advises that he is anxious to secure quotations from American manufacturers of all types of tire fabrics, sheetings and ducks, as well as all rubber chemical and compounding materials. He suggests the forwarding of samples and lowest cash quotations.

Anniversary for Pharis Rubber

The Pharis Rubber Company, Newark, Ohio, is celebrating its 25th anniversary in the manufacture of tires and tubes. The company was founded in 1910, starting with a daily production capacity of 50 tires. Current production is said to be around 7,500 tires per day, 5,000 tubes and some 2,000 bicycle tires

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, JUNE 10, 1935

Crude Rubber

WITH few interruptions rubber prices climbed steadily last month reaching a high on the Exchange for spot on May 27 with a quotation of 12.75. Low for the month was 11.56 quoted on May 10. Closing price on June 10 was 12.62, more than 100 points above the 11.56 price on May 10. Announcement of an advance of export taxes on rubber shipments from the Dutch East Indies resulted in a jump of 27 points in the price of spot rubber from 11.88 on May 13 to 12.15 on May 14, the first time in several months that a 12 cent price was reached. Intense speculative interest forced the price up steadily until it reached the 12.75 high on May 27. Prices broke 40 points, however, when news of the Supreme Court's decision in the Schecter poultry case reached the exchange resulting in a lowered price of 12.35 on May 28. Futures are quoted approximately 80 points above spot. Quotations in the outside market, Exchange, London and Singapore, follow:

As of June 10

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.12⅝
June	—	@	.12⅝
July-Sept.	—	@	.12⅞
First Latex, crepe spot	—	@	.13
Amber Crepe, No. 2	—	@	.11¼
Amber Crepe, No. 3	—	@	.11¼
Amber Crepe, No. 4	—	@	.11⅛
Brown Crepe, clean thin	—	@	.11⅞
Brown Crepe, rolled	—	@	.11¾

Latex—

Liquid Latex, per gal.	.50	@	.51

Paras—

Up-River, fine	—	@	.09½
Acre Bolivian, fine	—	@	.09¾

Balata—

Block, Ciudad	—	@	.33

LONDON MARKET

Standard Smoked Sheets—Buyers—June 7

June	—	@	6d
July-Sept.	—	@	6⅛d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—June 7

June	—	@	5¾d
July-Sept.	—	@	5⅞d

Reclaimed Rubber

Due to the firmness of crude rubber, which is expected to top a 13 cent mark shortly, reclaims at present prices are considered good buys. Quotations are unchanged since our last report. Activity is quiet at this writing due to the unsettled conditions following the NRA decision, but reclaimers look for a pick-up in business and expect a decided improvement for the balance of the year. Quotations follow:

High Tensile

Super-reclaim, black	.08¾	@	.09
High Tensile Red	.07	@	.07¼

Shoe

Unwashed	.06½	@	.06¾
Washed	.08	@	.09

Tube

No. 1 (Floating)	.13	@	—
No. 2 (Compounded)	.07½	@	.07¾

Tires

Black	.05	@	.05¼
Black, selected tires	.05¼	@	.05½
Dark Gray	.06¼	@	.06½
White	.09¼	@	.09½
Truck, Heavy Gravity	.05½	@	.06
Truck, Light Gravity	.06	@	.06¼

Miscellaneous

Mechanical blends	.04¼	@	.04½

Scrap Rubber

Activity in scrap has been comparatively quiet. Inner tubes have been holding firm with red up ⅛ cent. Boots and shoes and arctics are down 50c to $1.00 a ton. Tires are plentiful but dealers find them unprofitable to pick up. Conditions look promising for the second half of the year. Prices follow:

(Prices to Consumers)

Auto tire peelings	ton 17.00	@	19.00
Mixed auto	ton 7.50	@	8.50
Clean solid truck tires	ton 32.00	@	35.00
Boot and shoes	ton 17.00	@	19.00
Arctics, untrimmed	ton 13.00	@	15.00
Inner tubes, No. 1	lb. .07¼	@	.07⅜
Inner tubes, No. 2	lb. .03⅛	@	.03¼
Inner tubes, Red	lb. .02½	@	.02⅝

Cotton

Dominated by Government activities spot cotton prices advanced steadily during the early part of May reaching a new high for several months in the 12.50 price quoted on May 17. Prices broke sharply on May 28 following the decision of the Supreme Court invalidating the President's code-making powers, touching 11.90 on May 29. An additional drop of 60 points to an 11.30 price, low for the month, on May 31, was due to general liquidation, some short selling, stop loss selling, in addition to heavy selling from France because of the indefinite state of the French government. In all, prices decreased about $6.00 per bale because of the NRA collapse. Subsequently, a covering and buying movement, in addition to Government announcement that the AAA would be continued in full force and effect, resulted in better conditions on the market, with the result that prices have begun to advance again reaching 12.05 on June 8. Quotations for middling uplands on the N. Y. Cotton Exchange follow:

	May 8	June 10		
	Close	High	Low	Close
July	11.86	11.60	11.50	11.57
October	11.50	11.30	11.20	11.26
December	....	11.31	11.20	11.28

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)

Peeler, carded, 23/5/3	lb. .34	@	.34½
Peeler, carded, 23/4/3	lb. .35	@	.35½
Peeler, carded, 15/3/3	lb. .32	@	.32½
Peeler, carded, 13/3/3	lb. .31	@	.31½
Egyptian, carded, 23/5/3	lb. .46	@	.46½
Egyptian, combed, 23/5/3	lb. .51	@	.51½
CHAFERS			
Carded, American, 1 1/16"	lb. .35	@	.36
Carded, American, 1"	lb. .30	@	.32
LENO BREAKER			
Carded, American, 1 1/16"	lb. .36	@	.37
Carded, American, 1"	lb. .31	@	.32

Sheetings

Count	Width	Weight			
48x40	36 in.	5.50	lb.	— @	.05¼
40x40	36 in.	6.15	lb.	— @	.04⅞
40x36	36 in.	6.50	lb.	— @	.04⅝
48x48	40 in.	2.50	lb.	— @	.10⅝
48x48	40 in.	2.85	lb.	— @	.09¾
56x60	40 in.	3.60	lb.	— @	.08¼
48x44	40 in.	3.75	lb.	— @	.07¾
44x40	40 in.	4.25	lb.	— @	.06¾

Ducks

Enameling	lb. .32	@	.32½
Belting and Hose	lb. .34	@	—
Single filling, A grade	lb. .16¾	@	.17¼
Double filling	lb. .17¾	@	.18¼

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 tons

FROM MAY 9 TO JUNE 10

Date	Spot	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sales
May 9	11.65	11.62	11.70	11.78	11.83	11.88	11.95	12.03	12.11	12.17	12.25	12.34	12.42		157
10	11.56	11.59	11.67	11.75	11.80	11.86	11.93	12.00	12.08	12.15	12.22	12.30	12.38		47
11	11.69	11.76	11.81	11.87	11.93	12.00	12.07	12.15	12.23	12.30	12.38	12.46	12.54		94
12															
13	11.88	11.90	11.95	12.00	12.07	12.14	12.21	12.28	12.35	12.43	12.50	12.58	12.65		213
14	12.15	12.17	12.22	12.28	12.34	12.41	12.48	12.55	12.62	12.70	12.78	12.86	12.94		557
15	12.15	12.19	12.24	12.28	12.34	12.42	12.48	12.55	12.62	12.69	12.76	12.85	12.93		240
16	12.28	12.33	12.38	12.43	12.48	12.53	12.60	12.67	12.76	12.85	12.92	12.99	13.07		394
17	12.08	12.14	12.18	12.22	12.28	12.34	12.42	12.50	12.58	12.67	12.74	12.81	12.89		344
18	11.98	12.10	12.14	12.18	12.24	12.30	12.36	12.43	12.50	12.58	12.64	12.74	12.82		130
19															
20	12.00	12.10	12.16	12.22	12.28	12.35	12.41	12.48	12.55	12.64	12.71	12.79	12.87		149
21	12.32	12.38	12.41	12.44	12.50	12.55	12.63	12.71	12.79	12.86	12.94	13.02	13.12		298
22	12.56	12.54	12.58	12.63	12.70	12.78	12.85	12.92	12.99	13.08	13.16	13.24	13.32		490
23	12.50	12.51	12.34	12.58	12.64	12.71	12.78	12.85	12.93	13.03	13.10	13.18	13.26		254
24	12.44	12.44	12.50	12.56	12.61	12.67	12.73	12.80	12.88	12.96	13.04	13.12	13.20		313
25	12.69	12.72	12.76	12.81	12.86	12.92	13.00	13.07	13.15	13.23	13.31	13.39	13.47		294
26															
27	12.75	12.77	12.78	12.83	12.89	12.96	13.03	13.10	13.17	13.27	13.35	13.43	13.51		278
28	12.35	12.42	12.39	12.48	12.54	12.59	12.66	12.73	12.81	12.92	13.00	13.08	13.16		632
29	12.25	12.32	12.28	12.38	12.44	12.50	12.56	12.63	12.70	12.78	12.86	12.94	13.02		283
30															
31	12.20	——	12.21	12.31	12.37	12.43	12.50	12.57	12.64	12.71	12.79	12.87	12.95		317
June 1	12.18	——	12.13	12.23	12.28	12.34	12.41	13.48	12.55	12.63	12.70	12.78	12.86	12.94	282
2															
3	12.12	——	12.12	12.22	12.29	12.35	12.42	12.49	12.57	12.65	12.72	12.79	12.87	12.95	242
4	12.50	——	12.46	12.55	12.61	12.68	12.74	12.81	12.88	12.96	13.04	13.12	13.20	13.28	218
5	12.56	——	12.53	12.62	12.68	12.75	12.81	12.88	12.95	13.03	13.13	13.26	13.32	13.39	186
6	12.50	——	12.47	12.56	12.60	12.65	12.72	12.79	12.87	12.94	13.02	13.10	13.18	13.26	153
7	12.52	——	12.53	12.62	12.68	12.73	12.79	12.85	12.91	12.99	13.08	13.16	13.24	13.32	129
8	12.62	——	12.65	12.74	12.79	12.85	12.92	12.99	13.07	13.15	13.23	13.32	13.40	13.48	144
9															
10	12.62	——	12.64	12.73	12.79	12.85	12.91	12.98	13.05	13.14	13.22	13.30	13.38	13.46	95

Rubber CHEMICAL Markets

NEW YORK, JUNE 10, 1935

[All Quotations F.O.B. Works Unless Otherwise Noted]

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.21 @	.25
A-5-10	lb.	.33 @	.36
A-7	lb.	.53 @	.65
A-11	lb.	.60 @	.75
A-16	lb.	.55 @	.65
A-19	lb.	.56 @	.75
A-32	lb.	.70 @	.80
A-17	lb.	— @	—
Aldehyde ammonia, crystals	lb.	.65 @	.67
Altax	lb.	— @	—
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.44 @	.47
Diphenylguanidine	lb.	.35 @	.37
Ethylidene aniline	lb.	.45 @	.47½
Formaldenyde aniline	lb.	.37½ @	.42
Guantal	lb.	.42 @	.51
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.37 @	—
Lead Oleate, No. 999	lb.	.11 @	—
Witco	lb.	.11 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
Pipsolene	lb.	3.55 @	4.00
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R-2	lb.	1.55 @	1.90
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Thiocarbanilid, drums	lb.	.21 @	.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.62 @	1.00
Ureka B	lb.	— @	—
Ureka C	lb.	.58 @	.69
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.48 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.06½ @	—
Magnesia, calcined, heavy	ton	60.00 @	65.00

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.36 @	.38
Ultramarine	lb.	.10 @	.12
Browns			
Sienna, Italian	lb.	.06 @	'13
Umber, Turkey	lb	.04 @	.04½
Greens			
Chrome, light	lb.	.20 @	.30
medium	lb.	.21 @	.31
Chromium Oxide, bbl.	lb.	.22 @	.23
Guignet's Green	lb.	.70 @	—
Reds			
Antimony			
crimson, 15/7	lb.	.46 @	—
sulfur, free	lb.	.48 @	.60
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.09¼ @	—
Whites			
Cryptone CB, No. 21	lb.	.06 @	.06¼
Cryptone, No. 19	lb.	.06 @	.06¼
Lithopone			
Albalith, black label—11	lb.	.04½ @	.04¾
Azolith	lb.	.04½ @	.04¾
Rayox	lb.		
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
XX—20 Zinc Sulphide, bbls.	lb.	.10½ @	.10¾
XX—86 Zinc Sulphide, bbls.	lb.	.10½ @	.10¾
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾ @	.06
ZZ (leaded)	lb.	.05½ @	.05¾
Horsehead Lead Free Brand:			
Special—3	lb.	.05¾ @	.06
XX Red—4	lb.	.05¾ @	.06
XX Red—72	lb.	.05¾ @	.06
XX Red—78	lb.	.05¾ @	.06
XX Red—103	lb.	.05¾ @	.06
U. S. P.—X, bbls.	lb.	.12½ @	.12¾
Kadox, black label—15	lb.	.09½ @	.09¾
Blue label—16	lb.	.08¾ @	.08¾
Red label—17	lb.	.07 @	.07¼
St. Joe, black label	lb.	.05¾ @	.06
green label	lb.	.05¾ @	.06
red label	lb.	.05¾ @	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾ @	.06
Anaconda, selected lead free	lb.	.06 @	.06¾
Florence White seal—7 bbls.	lb.	— @	.10¾
Green seal—8	lb.	.09¾ @	.09¾
Red seal—9	lb.	.08¾ @	.08¾
Yellows			
Chrome	lb.	.15 @	.16
Ocher, dom. med.	lb.	.02¾ @	—

BLACKS

Arrow "Aerfloted" Specification	lb.	.0535 @	.0825
Bone, powdered	lb.	.05½ @	.12½
Carbon, compressed	lb.	.0535 @	.0825
uncompressed	lb.	.0535 @	.0825
"Certified," Cabot	lb.	.0535 @	.0825
Spherons	lb.	.0535 @	.0825
"Dispersо"	lb.	.0535 @	.0825
Drop, bbls.	lb.	.05½ @	.14
"Excello," compressed	lb.	.0535 @	.0825
"Fumonex"	lb.	.03 @	.07
"Gastex"	lb.	.03 @	.07
Lampblack	lb.	.07 @	.12
"Micronex"	lb.	.0535 @	.0825
"Supreme"	lb.	.0535 @	.0825
Thermatomic—"P 33"	lb.	— @	—
"Thermax"	lb.	— @	—
United "Dixie" & "Kosmos"	lb.	.0535 @	.0825

COMPOUNDING MATERIALS

Aluminum Flake	ton.	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	14.00 @	15.00
Barium carbonate (98-100%)	ton	56.50 @	61.50
Barium Dust	lb.	.05 @	.06
Barytes	ton	22.00 @	24.00
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	70.00 @	75.00
Calcene	ton	35.00 @	43.00
Catalpo (fact.)	lb.	.02 @	.11
Chalk, precipitated			
Suprex white, extra lt.	ton	45.40 @	60.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	7.50 @	15.00
Aerfloted, Suprex	ton	8.50 @	10.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Dixie, Jr.	ton		
Lexington	ton	10.00 @	22.00
McNamee	ton		
Par	ton		
Tensulite		15.00 @	—
Witco	ton	8.50 @	9.00
Cotton Flock	lb.	.10½ @	.18
Glues, extra white	lb.	.28 @	.30
medium white	lb.	.14 @	.19
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesium carbonate	lb.	.08 @	—
Mica	ton	65.00 @	80.00
Rottenstone, powdered	lb.	.02½ @	.05
Soapstone, powdered	ton	16.00 @	22.00
Starch, powdered	cwt.	3.56 @	3.76
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	ton	17.00 @	18.00
Columbia Filler	ton	9.00 @	14.00
English Cliffstone	ton	33.00 @	43.00
Sussex	ton		
Witco	ton	15.00 @	—
Wood Flour	ton	18.00 @	30.00
Zinc Carbonate	lb.	.10½ @	.11
Zinc Stearate	lb.	.25 @	—

MINERAL RUBBER

Black Diamond	ton	27.00 @	—
Genasco, solid (factory)	ton	25.00 @	27.00
Hard Hydrocarbon	ton		
Parmr, solid	ton	25.00 @	28.00
Pioneer, MR, solid	ton		
Pioneer-granulated	ton		

SPECIALTIES

Aromatics—Rodo	lb.		
Para-Dors No. 5145	lb.	2.00 @	—
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.80
Tonox	lb.	.56 @	.60

SOFTENERS

Acids			
Acetic, 28%, bbls.	100 lb.	2.40 @	—
glacial, USP, bbls.	100 lb.	12.25 @	—
Nitric, 36 degrees	cwt.	5.00 @	6.00
Sulfuric, 66 degrees	ton	15.50 @	16.50
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08½ @	.13
Stearic, double pressed	lb.	.09 @	.14
Alkalies			
Caustic Soda, 76%	cwt.	3.00 @	4.00
Soda Ash, 58% C.L.	cwt.	2.52 @	—
Oils			
Corn, refined, bbls.	lb.	.12½ @	—
Cottonseed, crude	gal.	.093 @	.10
Cycline Oil	gal.	.15 @	.28
Degras (c.l. 100 bbls.)	lb.	.02¼ @	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¼ @	—
Fluxrite	lb.	.05½ @	.06½
Palm Lagos	lb.	.05 @	—
Niger	lb.	.04¾ @	—
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.02 @	.02½
Pigmentaroil, tank cars	gal.	.16 @	—
in drums	gal.	.22 @	.23½
Pine, steam distilled	gal.	.64 @	.65
dest. dist., drums	gal.	.40 @	.45
Rosin Oil, cmpd.	gal.	.40 @	—
Rubtack	lb.	.40 @	—
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.05 @	—
Witco Softener (f.o.b. wks.)	gal.	.15 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Wobonite, c.l.	lb.	.05 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.05½ @	.06
hardwood	ton	20.00 @	25.00
pine, 200 lb. gr. wt	bbl.	6.00 @	—
Rosin, grade K, 280 lb.	bbl.	6.00 @	—
Pigmentar, tank cars	gal.	.16 @	—
in drums	gal.	.22 @	.23½
R. S. L. Resin	lb.	— @	—
Retort Pine Tar, drums	bbl.	12.00 @	13.00
Solvents			
Acetone, pure	lb.	.12½ @	.13½
Alcohol, denatured, methanol, No. 1 bbls.	gal.	.29½ @	—
Benzene, 90%	gal.	.15 @	.24
Beta-Trichlorethane	gal.	— @	—
Bondogen	lb.	— @	—
Carbon, bisulfide	lb.	.05½ @	.06
Carbon, tetrachloride	lb.	.05 @	.05¾
Dichlorethylene	lb.	.29 @	—
Dipentene, cml., drums	gal.	.40 @	.41
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05½ @	.06½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.31
Plastogen	lb.		
Reogen	lb.		
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Trichlorethylene	lb.	— @	.09½
Turpentine, spirits	gal.	.54 @	—
dest. dist., drums	gal.	.45 @	—
Waxes			
Beeswax, white	lb.	.34 @	.37
Carnauba, yellow	lb.	.34 @	.36
Ceresin, white, dom.	lb.	.08 @	.11
Montan, crude	lb.	.10 @	.11
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.03¼ @	—
White crude scale 124/126	lb.	.03¼ @	—
Refined, 125/127	lb.	.04¼ @	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
HP	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Flectol-H	lb.	— @	—
Flectol White	lb.	— @	—
Flectol B	lb.	— @	—
Neozone	lb.		
Oxynone	lb.	.66 @	.90
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

MOLD LUBRICANTS

Aresklene	lb.	— @	—
Cocoa Soapstock	lb.	.06 @	.08
Dipex	lb.	.06 @	.08
Rusco, f.o.b. Nitro	lb.	.12 @	.30
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Soap Tree Bark, cut, sifted	lb.	.06 @	.08
Zip (Mold Wash)	lb.	— @	—

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.13¾ @	—
Black	lb.	.08½ @	—
White	lb.	.08 @	.12
Brown	lb.	.07 @	.11½
Duphax	lb.	.10 @	—

VULCANIZING INGREDIENTS

Sulfur Chloride, yellow (drs.)	lb.	.03½ @	.04
Sulfur flour,			
Refined, 100% pure (bags)	cwt.	3.45 @	—
Commercial (bags)	cwt.	1.95 @	2.80
Telloy	lb.		
Vandex	lb.		

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Re-exports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	427,280
1934	449,322	97,898,519	10.06	23,848	5,770,109	11.23	425,615
1933:							
June	22,900	1,780,495	3.47	1,276	156,168	5.46	21,624
July	44,625	4,293,111	4.29	1,419	219,945	6.92	43,206
August	44,257	5,391,709	5.44	2,205	302,132	6.12	42,052
Sept.	44,912	6,110,956	6.07	2,369	335,798	8.89	42,543
Oct.	44,474	6,115,330	6.14	2,669	397,167	6.64	41,805
Nov.	40,582	5,850,714	6.44	2,188	333,631	6.81	38,394
Dec.	39,461	5,869,556	6.75	1,888	293,690	6.94	37,573
1934:							
Jan.	47,963	7,403,123	6.89	1,975	352,116	7.96	45,988
Feb.	34,335	5,262,711	6.84	2,133	476,232	9.97	32,202
Mar.	41,119	6,765,173	7.34	2,947	583,313	8.83	38,172
April	43,841	8,232,746	8.37	2,814	588,453	9.18	41,027
May	48,494	10,001,239	9.21	2,389	544,212	10.17	46,105
June*	47,289	10,747,464	10.14	2,012	501,499	11.33	45,277
July	41,443	9,670,617	10.41	2,366	660,199	13.99	39,077
August	31,531	7,873,690	11.15	1,393	400,433	12.83	30,138
Sept.	31,074	8,293,859	11.92	1,665	474,446	12.72	29,409
Oct.	28,318	8,203,447	12.93	2,058	620,754	13.46	26,260
Nov.	36,325	10,470,076	12.87	1,230	327,672	11.89	35,095
Dec.	17,590	4,974,374	12.62	866	240,780	12.46	16,724
1935:							
Jan.	39,675	10,852,308	12.21	977	278,229	12.72	38,698
Feb.	47,271	12,291,242	11.61	1,845	480,440	11.62	45,426
March	45,350	11,801,152	11.62	1,868	486,379	11.62	43,482
April	39,735	10,096,487	11.34	1,096	285,903	11.64	38,639

* Revised.

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex (1) Tons	Liquid Latex (1) Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1933	—	—	1,658	2,261,869	5,989	944,895	11,085	1,833,671
1934	402	75,349	1,054	438,209	4,988	943,752	13,070	3,633,253
1934:								
May	100	18,928	143	65,471	538	95,710	1,407	368,642
June	51	9,422	84	49,881	388	71,672	1,458	421,317
July	—	—	160	63,963	482	87,412	1,231	385,733
August	100	18,607	100	36,732	516	85,651	1,169	369,335
Sept.	—	—	48	14,415	259	47,542	936	312,967
Oct.	—	—	14	2,797	278	48,287	922	282,503
Nov.	—	—	60	20,169	332	60,904	887	296,447
Dec.	—	—	6	2,458	192	31,947	581	184,588
1935:								
Jan.	—	—	81	34,687	448	80,097	848	287,583
Feb.	—	—	62	20,981	222	33,850	573	179,583
March	—	—	57	15,917	488	80,643	1,290	354,654
April	—	—	51	11,452	419	58,429	1,721	415,100

(1) Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

(All Quantities in Long Tons)

	1928	1929	1930	1931	1932	1933	1934	1935
Figures on Monthly Basis								
Jan.	34,403	43,002	36,194	28,557	29,648	22,645*	39,284*	47,103
Feb.	33,702	41,594	33,302	28,797	31,821	21,392*	40,609	43,187
Mar.	35,688	44,730	35,540	32,788	29,505	17,483*	47,097	42,620
Apr.	32,772	47,521	39,686	33,321	27,518	25,928	44,853*	44,714
May	37,333	49,233	39,386	37,817	30,957	44,074	43,012	
June	37,676	43,227	34,195	37,916	41,475	50,743*	40,241	
July	37,407	41,526	29,508	31,397	29,976	49,614*	32,647	
Aug.	42,927	38,274	30,850	27,586	23,721	44,428*	33,310	
Sept.	39,882	34,707	25,515	23,638	23,847	35,281*	30,352	
Oct.	40,857	34,800	27,516	22,277	22,286	31,543*	31,347	
Nov.	37,461	27,659	23,691	22,943	23,231	28,831*	34,842	
Dec.	31,232	25,531	21,687	21,409	18,015	28,757*	36,662	
Tot.	441,340	469,804	375,980	348,986	332,000	400,719*	454,350*	

* Revised.

Reclaimed Rubber in the United States

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,213
1927	189,144	178,471	47.6	24,980
1928	208,516	223,000	50.4	24,785
1929	218,954	226,588	48.4	27,464
1930	157,967	153,497	40.8	22,000
1931	133,351	124,126	33.9	19,257
1932	75,608	77,504	23.4	16,354
1933	99,560	81,602	19.9	20,746
1934	110,010	100,597	22.3	23,079

	Production	Consumption Tons	Consumption % to Crude	Stocks*
Figures on Monthly Basis				
1934:				
Jan.	9,828	7,000	17.8*	24,263
Feb.	9,504	7,646	18.8	23,356
Mar.	11,479	9,683	20.6	25,113
Apr.	10,185	9,387	20.9	22,033
May	10,848	9,500	22.1	22,887
June	10,820	9,459	23.5	23,664
1935:				
Jan.	10,465	11,261	23.9	22,291
Feb.	10,072	9,374	23.3	22,989
Mar.	10,549	9,741	22.9	20,637
Apr.	10,315	10,466	23.4	20,521
May	.....	.....	...	.....
June	.....	.....	...	.....
July	9,446	8,175	25.0	24,926
Aug.	8,160	8,493	25.5	24,607
Sept.	6,974	7,028	23.2	24,540
Oct.	8,145	8,167	26.1	24,511
Nov.	7,268	7,775	22.3	23,999
Dec.	7,353	8,284	22.6	23,079
July	.....	.....	...	.....
Aug.	.....	.....	...	.....
Sept.	.....	.....	...	.....
Oct.	.....	.....	...	.....
Nov.	.....	.....	...	.....
Dec.	.....	.....	...	.....

* Stocks on hand at the end of month or year.
* Revised.

U. S. Consumption of Gasoline

(Bureau of Mines Statistics)

(In Thousands of Barrels of 42 Gallons)

	1933*	1934	1935
January	26,397	29,416	28,062
February	23,320	25,048	26,432
March	28,123	30,528	31,997
April	29,791	32,735	36,076
May	33,709	38,141	
June	37,699	36,296	
July	34,087	37,393	

	1932	1933*	1934
August	35,706	37,400	38,933
September	33,828	34,580	34,877
October	32,680	33,022	37,544
November	29,895	30,312	34,839
December	27,110	28,572	30,486
Total	373,900	377,003*	406,267

* Revised on basis of final 1933 figures issued September 26 1934 by Bureau of Mines.

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1933																																
February	21⅜	21⅜	21⅜	21⅜	—	3	21⅜	21⅜	3	3	3	—	—	21⅜	21⅜	21⅜	—	—	—	21⅜	21⅜	3	21⅜	21⅜	21⅜	23⅜	23⅜	21⅜	21⅜	27⅜	27⅜	3
March	3	3	3	3	—	3	3	3	3	3	3	—	—	3	3	3	—	—	—	3	3	3	3	3	3	3	3	3	3	3	3	3
April	2⅝	2⅝	2⅝	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4	4	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	3⅞
June	6½	6½	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	5⅞	5⅞
July	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6¼	6¼
August	7⅛	7⅛	8	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	8½	8⅝	8⅝	8⅝	9⅜	9⅜	9⅜	8⅝	7⅞	7⅞	7⅞	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛
September	7⅛	7⅛	7⅝	7⅞	7⅞	7	7⅞	6⅞	6⅞	7⅛	7⅛	6⅞	6⅞	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛
October	7⅛	7⅛	7⅝	8	8	7⅞	8	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛
November	7⅛	7⅛	7⅝	8	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛
December	9¼	9¼	8	9¼	9⅛	8⅛	9⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	9⅛	8⅞	8⅞	8⅞	9	8⅞	8⅞	8⅞
1934																																
January	—	9	8⅛	9	9	9	—	8¼	8¼	8¼	8¼	8¼	8¼	—	9⅛	9⅛	9⅛	9⅛	9⅞	9¾	10⅛	9⅝	9⅝	9⅜	9⅛	10⅛	10	10⅜	10⅜	10	10	9⅝
February	9⅞	10⅛	9⅛	—	10⅛	10⅛	—	10⅛	10⅛	10⅛	—	—	—	10⅞	10⅞	10⅞	10⅛	10⅛	10⅞	10⅛	10⅛	—	—	10⅜	10⅛	10⅛	10⅛	10⅛	—	—	—	10⅛
March	10⅛	10⅛	10⅛	11⅛	10⅛	10⅛	10⅛	10⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛
April	11⅛	11⅛	11⅛	15	15⅛	15⅛	15⅛	15⅛	11⅛	11⅛	11⅛	12	12⅛	12⅛	12⅛	12⅛	12⅛	13	12⅞	12⅞	12⅞	13	13	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞
May	13	14⅜	14⅜	12⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜
June	13	14⅜	14⅜	15	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
July	14⅜	14⅜	15	—	—	—	—	—	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜
August	14⅜	14⅜	—	—	—	—	—	—	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜
September	14⅜	15	—	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜
October	14½	14½	13⅞	14	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	14⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜
November	13⅜	13⅜	13	13	13	13	13⅜	13⅜	13⅜	13⅜	13⅜	12⅞	12⅞	12⅞	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
December	13⅜	—	12⅞	13	13	13⅜	13⅜	13⅜	13⅜	13⅜	12⅞	12⅞	12⅞	12⅞	13	13	12⅞	13	13	13	13	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞	12⅞
1935																																
January	—	13½	13½	13½	13½	—	13¾	13¾	13⅝	13⅝	13⅝	13¾	—	13¾	13⅝	13⅜	13⅛	13	13	13⅛	13⅛	12⅛	12⅛	12⅛	12⅛	12⅛	12⅛	12⅛	12⅛	12⅛	12⅛	13⅛
February	13¾	13¾	—	13¾	13¾	12⅝	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜
March	12⅝	12⅝	—	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝
April	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11½
May	11⅝	11½	11⅝	11½	—	11½	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	12
June	12⅞	—	12⅞	12½	12½	12½	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121 60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.85

Average Monthly Price per Pound Since 1928

	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents	1934 Cents	1935 Cents
Jan.	20.14	15.24	8.34	4.38	3.08	9.32	13.10
Feb.	23.7	15.85	7.70	4.03	2.95	10.45	12.92
Mar.	24.55	15.34	7.71	3.35	3.01	11.01	11.51
Apr.	21.18	14.93	6.43	3.02	3.56	12.10	11.55
May	21.46	14.24	6.49	3.09	4.95	13.26	12.05
June	20.64	12.45	6.35	2.66	6.15	13.51	
July	21.30	11.24	6.37	2.89	8.01	14.60	
Aug.	20.59	9.96	5.38	3.63	7.31	15.47	
Sept.	20.37	8.28	5.08	3.84	7.30	15.36	
Oct.	19.67	8.20	4.87	3.65	7.64	13.96	
Nov.	16.62	9.01	4.65	3.44	8.66	13.04	
Dec.	16.12	9.05	4.64	3.24	8.87	12.98	
Average for Year	20.55	11.98	6.17	3.49	5.96	12.92	

London Closing Prices of Ribbed Smoked Sheets

(In Pence Per Pound)

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1	6 7/8	5 1/16	5 5/8	5 1/8	17	—	5 1/16	6	
2	6 1/4	5 1/16	5 5/8	—	18	5 1/8	5 1/16	—	
3	—	5 1/16	5 1/2	5 1/8	19	5 3/16	—	—	
4	6 7/8	5 3/8	—	6	20	5 1/2	—	5 7/8	
5	6 1/8	5 3/8	—	6	21	5 3/8	—	5 7/8	
6	6 1/8	5 3/8	—	6	22	5 1/4	—	6	
7	6	—	5 5/8	6	23	5 1/4	5 1/16	6	
8	6 1/8	5 3/8	5 5/8	—	24	—	5 1/16	6	
9	6	5 5/16	5 5/8	—	25	5 3/8	5 1/16	6 1/16	
10	—	5 1/2	5 5/8	—	26	5 1/2	5 3/4	—	
11	5 1/2	5 5/8	5 1/8	—	27	5 1/2	5 3/4	6 1/8	
12	5 1/2	5 5/8	—	—	28	5 1/2	—	6	
13	5 1/2	5 5/8	5 3/4	—	29	5 5/8	5 5/8	5 1/2	
14	5 7/8	—	5 1/2	—	30	5 5/8	5 1/2	5 1/2	
15	5 7/8	5 3/4	5 1/2	—	31	—	—	5 1/2	
16	5 7/8	5 5/8	5 1/2	—					

Average Monthly Price Per Pound

Month	1932 Pence	1933 Pence	1934 Pence	1935 Pence	Month	1932 Pence	1933 Pence	1934 Pence	1935 Pence
Jan.	3.052	2.264	4.429	6.434	Aug.	2.654	3.811	7.401	
Feb.	2.760	2.093	4.920	6.292	Sept.	2.485	3.728	7.409	
Mar.	2.047	2.099	5,136	5.745	Oct.	2.425	3.957	6.806	
Apr.	1.876	2.323	5.712	5.604	Nov.	2.518	4.096	6.294	
May	1.825	2.966	6.207	5.822	Dec.	2.444	4.200	6.295	
June	1.750	3.392	6.245		Average for Year	2.434	3.233	6.159	
July	1.875	3.860	7.053						

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	Apr.	May	June	Date	Apr.	May	June	Date	Apr.	May	June
1	11.30	12.15	11.55	11	11.90	12.35		21	—	12.40	
2	11.25	12.15	—	12	11.80	—		22	11.85	12.45	
3	11.20	12.25	11.50	13	11.95	12.25		23	11.80	12.35	
4	11.20	12.30	11.90	14	—	12.30		24	11.80	12.35	
5	12.20	—	11.80	15	12.00	12.35		25	12.00	12.40	
6	11.30	12.15	11.90	16	11.90	12.35		26	12.25	—	
7	—	12.15	11.80	17	11.75	12.50		27	12.25	12.30	
8	11.40	12.25	12.05	18	11.90	12.45		28	—	12.20	
9	11.55	12.40	—	19	—	—		29	12.20	11.90	
10	11.50	12.40	11.95	20	—	12.40		30	12.26	—	
								31	—	11.30	

Average Monthly Price Per Pound

	1932 Cents	1933 Cents	1934 Cents	1935 Cents		1932 Cents	1933 Cents	1934 Cents	1935 Cents
Jan.	6.65	6.23	11.25	12.70	Aug.	7.43	9.55	13.40	
Feb.	6.85	6.05	12.28	12.58	Sept.	6.30	9.64	13.00	
Mar.	6.86	6.39	12.30	11.63	Oct.	6.30	9.58	12.48	
Apr.	6.16	7.02	11.80	11.73	Nov.	6.22	10.04	12.53	
May	5.72	8.64	11.44	12.25	Dec.	6.00	10.17	12.76	
June	5.02	9.47	12.20		Average for Year	6.41	8.63	12.36	
July	5.87	10.76	12.84						

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1933	1934	1935	AFLOAT 1933	1934	1935	ON HAND AND AFLOAT 1933	1934	1935
Jan.	396,376	368,660	346,084	32,539	45,768	42,066	428,915	414,428	388,150
Feb.	381,794	358,681	*339,335*	32,898	53,063	42,969	414,692	411,744	*382,304*
Mar.	390,135	352,897	*338,700*	29,531	54,722	44,485	419,666	407,619	*383,185*
Apr.	382,167	351,073	*334,954*	30,745	56,251	37,651	412,912	407,324	*372,605*
May	364,623	351,329		43,342	57,921		407,965	409,250	
June	333,954	358,149		63,608	46,698		397,562	404,847	
July	326,609	364,883		57,435	45,869		384,044	410,752	
Aug.	325,148	362,647		53,084	40,278		378,232	402,925	
Sept.	334,637	359,667		57,255	38,831		391,982	398,498	
Oct.	343,579	362,018		58,568	38,247		402,147	400,265	
Nov.	353,852	361,236		57,140	38,625		410,992	399,861	
Dec.	364,541	352,632		55,606	47,644		419,147	400,276	

(Rubber Manufacturers' Association figures raised to 100%)

* Revised.

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1933	1934	1935	At end of	1933	1934	1935
Jan.	36,481	38,570	81,807	July	41,178	50,490	
Feb.	37,182	38,752	87,605	Aug.	39,480	48,953	
Mar.	40,689	40,501	92,664	Sept.	39,237	56,103	
Apr.	40,911	42,413	94,361	Oct.	37,101	63,079	
May	41,998	42,190		Nov.	36,139	67,656	
June	43,032	45,674		Dec.	35,615	72,285	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1934					
Dec.	67,901	69,337	70,256	71,849	72,314
1935					
Jan.	73,407	75,821	78,138	79,530	
Feb.	82,160	83,622	85,202	87,222	
Mar.	88,097	89,388	91,153	91,298	92,602
Apr.	93,209	94,130	94,361	94,543	
May	95,138	95,454	96,097	96,962	

Stocks in Liverpool

1934				
Dec.	60,164	60,125	62,243	62,573	62,617
1935				
Jan.	63,132	65,099	65,977	65,768	
Feb.	66,429	67,043	67,846	68,243	
Mar.	68,266	68,963	69,440	69,616	69,332
Apr.	70,151	70,057	70,886	70,729	
May	71,488	71,278	71,673	72,027	

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1932	1933	1934	1935	End of	1932	1933	1934	1935
Jan.	48,850	22,525	40,405	50,588	July	17,017	36,972	65,099	
Feb.	46,954	21,530	41,884	51,628	Aug.	20,649	38,601	59,227	
Mar.	46,591	24,594	47,933	46,046	Sep.	20,415	36,948	54,905	
Apr.	39,663	25,460	48,431	43,295	Oct.	23,158	37,282	54,155	
May	38,690	29,822	76,393		Nov.	25,419	39,018	49,282	
June	19,770	34,676	73,218		Dec.	25,341	38,269	51,255	

STOCKS IN OTHER CENTRES

End of: 1934	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Feb.	39,630	36,563	906	5,366	3,420
Mar.	37,275	33,365	904	4,083	3,519
Apr.	33,765	32,640	905	4,070	3,624
May	7,213	39,370	897	3,066	3,556
June	20,243	36,870	902	3,533	3,273
July	27,235	35,430	1,263	4,683	3,094
August	30,507	36,060	1,322	5,713	2,849
Sept.	33,661	39,630	1,290	5,137	3,075
Oct.	31,762	40,560	1,401	5,675	3,113
Nov.	33,590	39,870	1,404	5,631	3,081
Dec.	23,173	41,200	1,326	5,732	3,293
Jan., 1935	33,609	35,600	1,397	5,926	3,477
Feb.	32,062	36,000	1,534	4,753	3,153
Mar.	31,844	36,000	1,551	3,917	3,214
Apr.	33,583		1,536	4,750	4,626

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1924	21,863,311	1928	24,247,282	1932	6,261,336
1925	26,001,664	1929	24,141,502	1933	8,713,962
1926	24,199,524	1930	17,364,096	1934	12,255,118
1927	19,700,003	1931	11,253,800	1935	

1933:		1935:		1934:	
January	1,868,723	May	1,561,434	September	526,472
February	1,616,398	June		October	629,878
March	1,724,077	July		November	577,713
April	1,907,032	August		December	1,199,240

U. S. Tire and Tube Statistics[1]

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1927	1928	1929	1930	1931	1932	1933	1934
Production	64,439	77,944	68,726	50,965	48,739	40,085	45,304	47,233
Shipments	64,059	74,296	69,395	53,638	48,151	40,260	44,094	46,687
Inventory[2]	10,264	13,624	11,838	9,003	7,775	7,644	8,888	9,455

Figures for Recent Months

	PRODUCTION 1933	1934	1935	SHIPMENTS 1933	1934	1935	INVENTORY 1933	1934	1935
Jan.	2,258	3,922	4,626	2,597	3,222	3,663	7,237	9,684	10,398
Feb.	2,339	4,335	4,383	2,292	3,285	3,287	7,377	10,725	11,530
Mar.	2,038	5,180	4,346	2,092	4,223	4,204	7,290	11,651	11,675
Apr.	3,123	4,470		3,654	4,438		6,778	11,981	
May	5,189	4,456		5,180	5,332		6,760	11,127	
June	6,100	4,342		6,305	5,228		6,615	10,219	
July	5,714	3,353		5,497	4,157		6,844	9,437	
Aug.	4,994	3,533		4,707	4,308		7,070	8,697	
Sept.	3,999	2,936		3,503	3,183		7,595	8,419	
Oct.	3,249	3,287		2,537	3,010		8,462	8,657	
Nov.	3,039	3,341		2,197	3,191		9,247	8,779	
Dec.	3,082	3,778		3,531	3,109		8,888	9,455	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1927	1928	1929	1930	1931	1932	1933	1934
Production	70,823	80,180	68,829	52,420	48,333	36,891	42,546	46,228
Shipments	72,896	77,127	70,592	54,938	50,021	37,911	41,391	45,046
Inventory[3]	13,692	16,117	12,807	9,999	7,922	6,749	7,815	9,180

Figures for Recent Months

	PRODUCTION 1933	1934	1935	SHIPMENTS 1933	1934	1935	INVENTORY 1933	1934	1935
Jan.	2,093	3,530	4,259	2,535	3,199	3,722	6,197	8,403	9,621
Feb.	2,224	4,077	4,171	2,102	3,323	3,362	6,357	8,445	10,466
Mar.	1,883	5,194	4,123	1,902	4,118	4,168	6,369	10,244	10,406
Apr.	2,853	4,735		3,051	4,342		6,189	10,585	
May	5,189	4,359		5,180	4,902		6,760	10,043	
June	5,448	4,097		5,778	5,309		6,097	8,795	
July	5,603	3,531		5,211	4,323		6,440	8,053	
Aug.	4,916	3,680		4,687	4,198		6,628	7,555	
Sept.	3,827	3,110		3,472	3,024		7,008	7,639	
Oct.	3,506	3,219		2,676	2,689		7,831	8,151	
Nov.	2,863	3,169		2,103	2,767		8,625	8,503	
Dec.	2,631	3,503		3,410	2,850		7,815	9,180	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete for 1929-1933. Beginning 1934, the Association reported its figures to be 97% complete.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933*	1,920,057	1,573,512	346,545	65,924	53,855	12,069	1,992,126
1934	2,778,739	2,190,099	588,640	116,890	92,538	24,352	2,895,629
1934							
May*	331,652	273,765	57,887	20,161	16,504	3,657	351,813
June*	308,065	261,852	46,213	13,905	10,810	3,095	321,970
July*	266,576	223,868	42,708	11,114	8,407	2,707	277,690
August*	234,810	183,500	51,310	9,904	7,325	2,579	244,714
Sept.*	168,871	123,909	44,962	5,579	4,211	1,368	174,450
Oct.*	132,491	84,503	47,988	3,780	2,125	1,655	136,271
Nov.*	78,465	45,556	32,909	1,697	1,052	645	80,162
Dec.	183,187	128,059	55,128	2,732	2,334	398	185,919
1935							
Jan.*	292,817	229,233	63,584	10,607	8,269	2,338	303,424
Feb.*	335,699	275,623	60,076	18,114	13,885	4,229	353,813
March*	429,834	361,816	68,018	21,975	18,179	3,796	451,809
April	477,716	401,628	76,088	24,121	20,686	3,435	501,837

* Revised.

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA [1]							DUTCH EAST INDIES [4]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon [2]	India & Burma [3]	Sarawak [4]	British North Borneo [5]	Siam [6]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China [7]	Amazon Valley	All Other [8]	World Total [9]
1923	252,816	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1933	573,412	167,377	406,035	63,351	4,527	10,874	7,555	7,765	73,851	91,861	149,659	18,394	9,883	2,737	846,312
1933:															
March	42,153	7,964	34,189	4,905	389	571	458	304	5,092	6,466	6,999	1,102	995	103	61,573
April	36,823	7,758	29,065	4,582	272	624	583	235	5,226	5,969	8,147	1,122	556	183	56,564
May	42,917	13,664	29,253	4,643	475	1,091	583	359	6,782	7,298	13,195	1,371	918	143	66,111
June	41,482	16,538	24,944	5,198	377	1,149	582	632	7,352	6,654	14,779	1,369	704	124	63,864
July	50,531	18,772	31,759	4,201	270	1,358	728	797	7,367	8,580	16,534	1,310	913	166	73,983
Aug.	52,436	17,869	34,567	5,839	246	955	728	926	6,460	7,985	15,161	808	1,116	323	75,114
Sept.	49,607	15,146	34,461	5,111	125	1,027	727	611	5,868	9,164	15,005	1,702	656	274	74,731
Oct.	61,002	17,390	43,612	5,674	271	959	750	979	6,329	8,682	15,170	1,426	965	314	85,131
Nov.	54,599	20,142	34,457	6,097	516	1,020	750	1,303	6,684	9,951	14,474	1,553	956	366	78,127
Dec.	57,579	18,110	39,469	7,435	964	989	750	1,046	7,030	10,183	17,274	3,779	930	302	90,151
1934:															
Jan.	55,055	16,128	38,927	6,929	1,531	1,197	805	1,290	6,513	7,975	13,913	1,109	576	127	80,892
Feb.	57,867	15,027	42,840	8,620	775	1,005	805	1,264	6,706	9,211	13,696	1,232	831	105	87,090
March	58,515	19,907	38,608	6,750	1,412	1,360	806	1,363	8,655	10,539	19,084	1,968	846	113	91,504
April	56,748	20,957	35,791	5,157	762	1,447	894	1,311	7,282	9,808	19,250	1,330	440	236	83,708
May	69,403	25,691	43,712	8,870	1,106	1,892	1,397	997	12,104	14,606	26,598	1,243	726	328	113,579
June	53,282	20,981	32,301	5,397	1,425	1,886	644	1,497	4,860	6,192	15,956	1,593	765	377	72,893
July	53,335	22,829	30,506	3,818	710	1,662	1,048	2,399	5,762	7,369	14,415	1,703	353	252	69,997
Aug.	52,641	17,865	34,776	4,948	552	1,714	1,048	1,908	5,340	8,901	11,356	1,610	710	251	73,114
Sept.	61,051	17,889	43,162	6,555	294	1,438	839	1,626	5,722	10,738	14,688	1,665	764	222	87,713
Oct.	47,045	10,226	36,819	6,544	413	1,412	1,196	1,328	5,970	6,643	5,556	1,413	840	401	68,535
Nov.	51,140	8,759	42,381	6,756	501	953	941	1,356	7,621	7,123	5,338	2,356	1,017	334	76,676
Dec.	59,575	15,375	44,200	8,481	990	1,237	680	2,043	10,865	12,953	12,354	2,956	1,035	239	98,033
1935															
Jan.	56,720	17,142	39,578	5,202	2,269	1,630	1,222	2,614	3,812	5,371	8,704	2,650	1,106	460	74,629
Feb.	50,593	17,676	32,917	5,556	731	1,887	760	2,288	4,395	7,663	15,194	2,076	636	254	74,154
Mar.	47,407	13,437	33,970	3,181	701	1,901	773	2,076	5,592	7,950	7,973	1,472	740	300*	66,629
Apr.	53,360	16,029	37,331	3,749	700*	1,895	846	1,661	5,574	6,873	12,683	2,821	1,126	300*	75,433
May	51,353	23,720	27,633	4,473											

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons in 1924, 6 tons in 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons in 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. * Figure is provisional: final figure will be shown when available.

NOTE: THE FIGURES FOR 1933 ARE REVISED AS OF JANUARY 25, 1935 AND REPRESENT FINAL FIGURES

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,496	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1933	398,365	73,335	61,953	54,120	19,332	66,831	19,341	29,830	13,534	11,166	1,245	7,831	5,520	10,402	.....
1933:															
Sept.	43,886	4,341	4,111	5,841	2,620	5,369	2,055	2,168	794	864	189	604	790	577	74,211
Oct.	43,366	3,373	4,921	4,772	2,580	6,150	1,836	2,084	604	1,118	310	777	441	686	73,081
Nov.	39,633	3,955	5,419	4,086	2,184	6,296	942	4,483	301	1,129	222	878	493	882	70,903
Dec.	38,864	6,524	5,415	4,933	1,773	6,865	1,029	2,400	190	1,360	213	703	776	1,772	72,817
1934:															
Jan.	47,114	9,503	6,472	6,057	1,721	5,628	2,517	2,749	566	2,173	381	1,185	484	1,355	88,276
Feb.	33,087	10,785	5,301	5,490	1,854	4,570	2,388	3,399	950	1,538	287	464	656	516	73,357
Mar.	39,306	14,008	4,980	6,453	3,411	5,655	1,394	4,018	671	965	284	836	394	976	86,242
Apr.	42,262	9,999	3,210	6,701	2,419	5,679	1,966	1,326	415	504	262	1,217	752	465	77,177
May	47,412	9,786	3,634	6,499	2,218	6,905	2,218	4,360	769	214	322	940	147	1,768	87,192
June	46,785	16,564	3,803	6,171	2,208	6,745	1,887	3,145	1,512	837	331	843	1,146	1,624	93,601
July	40,308	12,266	4,051	5,494	2,430	5,739	708	1,640	732	810	540	1,602	747	1,094	78,161
Aug.	31,405	13,728	3,660	3,078	1,948	4,945	1,795	6,829	658	669	239	1,033	277	1,495	71,759
Sept.	30,345	11,254	4,244	2,607	2,770	7,346	1,486	4,487	743	501	339	980	465	477	68,044
Oct.	27,323	18,897	3,424	2,148	3,043	7,227	1,296	3,681	798	693	447	813	675	254	70,719
Nov.	35,982	15,875	3,176	3,425	1,568	5,580	1,764	4,488	516	379	187	1,382	542	215	75,079
Dec.	17,305	15,816	3,605	5,207	2,849	3,904	1,979	6,460	1,312	—168	139	1,143	615	762	60,928
1935															
Jan.	39,546	20,383	5,573	4,286	2,670	4,400	1,613	3,446	1,099	419	158	1,252	468	1,245	86,558
Feb.	45,999	15,609	4,593	3,513	1,558	5,582	4,356	1,810	848	399	477	838	567	1,836	87,985
Mar.	44,772	12,810	4,017	6,353	2,710	4,421	1,582	4,624	1,459	240	331	891	630	741	85,581
Apr.	40,360	11,574	3,306		1,063				1,150		329				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1] United States imports of guayule are included in this compilation. * Figure is provisional; final figure will be shown immediately it becomes available.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

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